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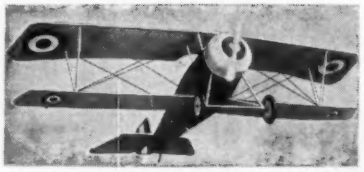

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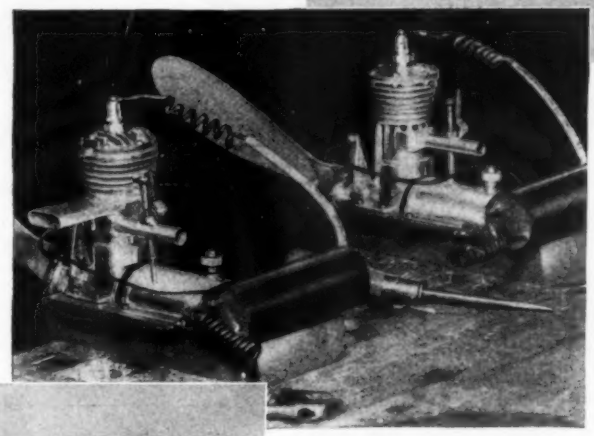

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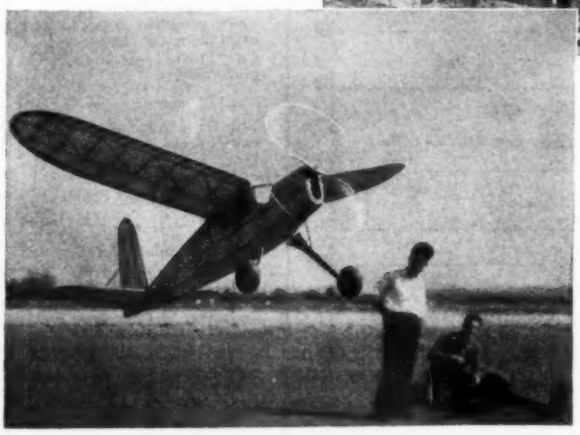

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Why Not Metal Models?, by Hans Justus Meier, is full of new ideas on model construction that should not be overlooked by progressive model builders.

A Precision Contest Gas Job (Part No. 2), by Elbert Weathers tells how to complete the unusual gas model he described in the Sept. issue of MODEL AIRPLANE NEWS.

Slants on Wind Tunnel Research, by George H. Tweeney tells the model engineer of the methods used to increase airplane efficiency.

Build and Fly This Stinson Trainer, by Jesse Davidson and Harry Appel provides an interesting building project for those who wish five performance when they have finished building this model.

Building a High Efficiency Soarer, by Paul Zakim and Henry Clark provides complete data to build a model sailplane that gives astounding performance.

For those who wish to experiment or fly for sport Stanley D. Marsh and Felix Gutmann present **An All Balsa Sportster.**

Other regular articles such as **N.A.A. Junior Membership News, Stabilizing Your Model for Duration**, by C. H. Grant, **Frontiers of Aviation**, by Robert C. Morrison, **"Gas Lines", Air Ways, Aviation Advisory Board**, and valuable 3 view drawings will appear.

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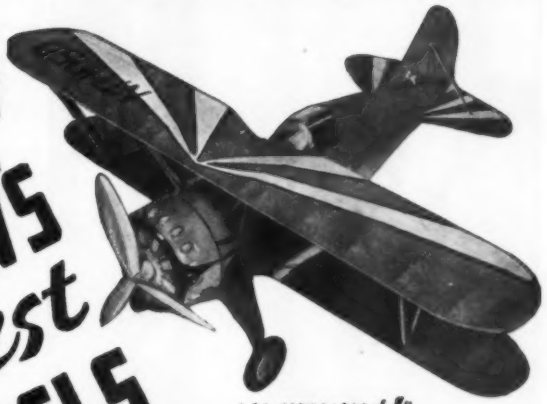

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Rocket Flight In America

The Story of the Development of Rockets by Americans, and How the Many Problems Involved Are Being Solved—Types of Rockets Used

By NICK LIMBER

Fig. No. 2. Members of the American Rocket Society preparing to launch rocket No. 3

WITH the ever increasing interest in rockets shown by the Europeans and the successful experiments conducted by Dr. Goddard, many Americans have become interested in this new science. Among the first of these pioneers is G. Edward Pendray, a scientific author.

Inspired by the work of the Germans and perhaps by the desire to visit other planets Mr. Pendray has organized the American Interplanetary Society. As there was much talk of the rocket's possibilities at the time, the members of the society could see no reason for not being able to get to the moon within a short time. However, before launching a major experimental program, Mr. Pendray sailed to Europe so that he might study the progress of the German Rocket Society and its much talked of experiments.

Upon his arrival in Germany Mr. Pendray at once realized that all hopes of reaching other planets should be forgotten, at least for the present. Through the German experiments he realized that many problems were to be solved before the rocket could even lift itself into the stratosphere.

On his return to New York he clearly outlined an experimental program that the society was to follow. He then established an experimental committee and designs for repulsor rockets were developed.

The first of the repulsors was completed and tested on a firing stand on November, 1931. Because of a mishap, however, it was not launched. Parts of it were used to complete the second rocket, (Fig. 1).

The second repulsor when completed was put through a series of strenuous test stand firings and was finally launched in May, 1933. The rocket, however, burst after reaching a velocity of 175 feet per second and an altitude of 300 feet. An investigation revealed that the oxygen tank had been ripped open at the point that was exposed to the exhaust flame. Examination also revealed that the metal had not melted by the heat of the exhaust flame but by some disruptive force from within, had been ripped open. When the investigation had been completed it was agreed that pressure created by the evaporation of liquid oxygen within the tank had caused an explosion.

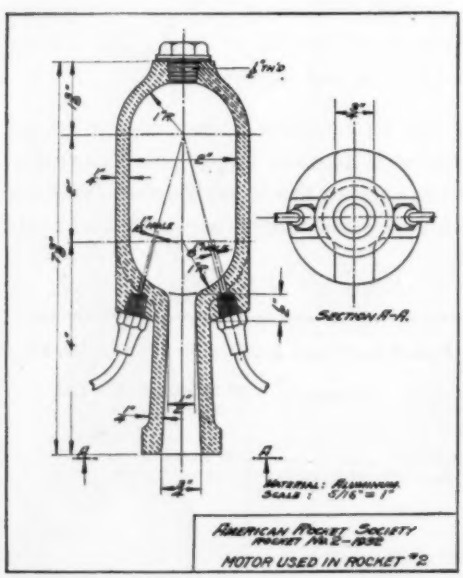
Undaunted by this failure on October of the same year the society's publication *Astronautics* announced that the construction of three new rockets had begun. The first of the new repulsors, Rocket No. 3 was designed by G. Edward Pendray, Alfred Africano and Bernard Smith. Among the innovations, an aluminum Venturi tube designed to increase lift and stability, was to be found on this rocket, (Fig. 2). Rocket No. 4 was designed by Lawrence Manning, John Shesta, Alfred Best and Carl Ahrens. This craft was carefully designed to minimize air resistance and had a cross-section of only three inches in diameter, (Fig. 3). Rocket No. 5 was designed by H. Franklin Pierce, Nathan Schachner and Nathan Carver.

A few months before the completion of these new rockets the American Interplanetary Society changed its name to the American Rocket Society. Although the trip to the moon had not been abandoned, the change was made because the word "Interplanetary" was distressing to the less imaginative potential members of the society.

With the change of the society's name and the completion of Rocket No. 4, preliminary firing tests were conducted at Staten Island on June 10, 1934. It was thus discovered that several changes were required before the repulsor could be shot. As the changes constituted a period of several months, it was not until September 9, that Rocket No. 4 could be launched.

A few seconds after the switch was thrown, the ship had attained an altitude of 382 feet and a speed of over 600 m.p.h. An extract from the official report in the October, 1934, issue of *Astronautics* describes the flight as follows:

"Directly the valves were opened the rocket leaped from the launching rack. Almost vertical flight was maintained for nearly 300



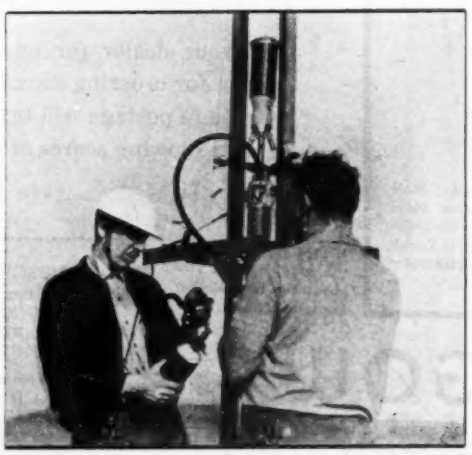


Fig. No. 3. Arranging the launching apparatus and the rocket in the launching chute, prior to firing

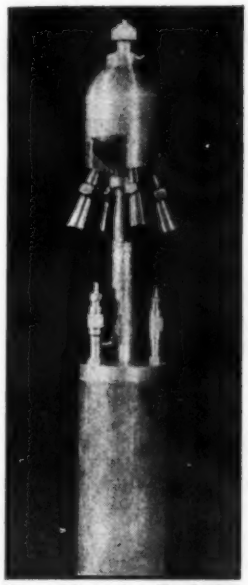
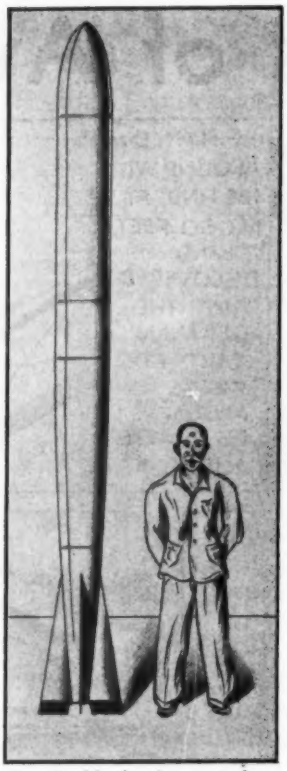
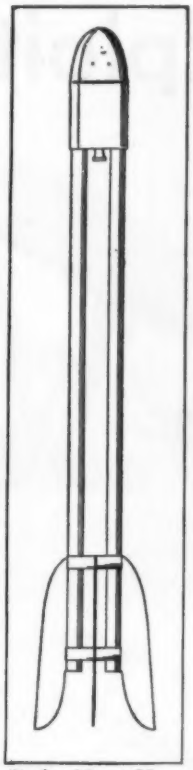


Fig. No. 4. Explosion chamber and jet of rocket No. 4



Dr. Goddard's latest rocket. One similar to this was said to have reached an altitude of 7500 ft.



Rocket No. 2. Note fuel tanks act as the body of the rocket

Fig. No. 5. A close-up of rocket No. 4 showing the parachute container

feet, at which point the rocket turned rather sharply out to sea. It was at this point, observers assume, that the burned out nozzle failed, shifting the direction of the propulsive forces acting on the rocket. The rocket rapidly sloped over until it was headed directly towards the water. Shortly after the change of direction it began to 'hunt.' It struck the ocean with a terrific splash, the force of the impact bending the upper part."

Thus the second shooting of the American Rocket Society had come to an end. After the rocket had been retrieved an examination revealed that the throat of one of the four exhaust nozzles had been burned, thereby throwing the rocket off its course and preventing the landing gear release from operating. Although this flight could not be classified as successful, it furnished the experimental committee with valuable facts, the first being that streamlining as known to us, is of no value in speeds greater than that of sound. Through some strange phenomenon the molecules of air do not flow around, but form an impenetrable mass in front of a streamline body if the body is traveling at a speed greater than that of sound. It is believed that because of the formation of such masses at the nose of the rocket searching occurs. As the rocket cannot penetrate the mass of air accumulated at its nose, it is forced to dodge around it. This dodging around the masses of air is called "searching" or "hunting."

Obviously, before a rocket can be shot in an altitude attempt, searching must be overcome.

Among the various people who have attempted to analyze and solve this problem is that eminent scientist Dr. Goddard.

Although his experiments are of the most secretive nature, through his report to the Smithsonian Institution we find that he has designed a small gyroscope stabilizer to offset this effect and maintain the rocket in straight flight. Photographic records of his October 14, and May 31, 1935, flights indicate remarkable results.

The Westchester Rocket Society, a newly organized society of engineering students, is also working on this problem but from a different angle. Instead of developing a gyroscope to offset searching, the experimental board has developed a new theory which if proven in the field, could eliminate searching. Their results, however, have not as yet gone beyond the theoretical stage. Among those working on the board we have Chas. H. Grant, E. Brygider, A. Moskowitz and Kurt Fisher.

The American Rocket Society is also reported to have taken interest in this problem but no results of their experiments are available.

It was decided by the experimental committee that a series of ground tests would be advisable before attempting to shoot Rockets No. 3 and 5.

Because the blast chamber or rocket motor, is the most important part of the rocket, these tests were to be experiments determining the most efficient type of motor. The first series of tests were made at the society's proving grounds at Crestwood on April 21, 1935. The rocket motors were attached to a testing stand and by special equipment it was possible to record the reaction and pressure of each motor during the firing period. (See Fig. 1.)

During these tests it was discovered that short exhaust nozzles are as effective as long nozzles and that fuel forced into the motor at high pressure is more efficient. The firing time ranged from nine to seventeen seconds and the maximum thrust from seventeen to fifty-nine pounds, the latter being accomplished during run No. 2 with a 300 pound pressure and a short exhaust nozzle.

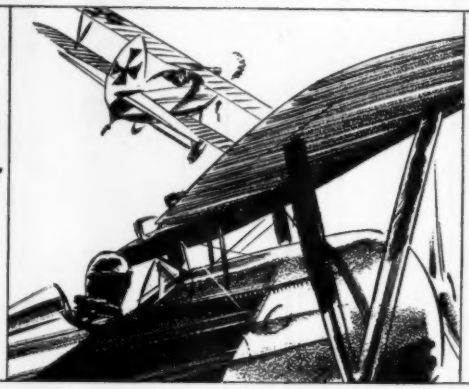
Although these tests furnished the society with important data, they also brought

(Continued on page 54)

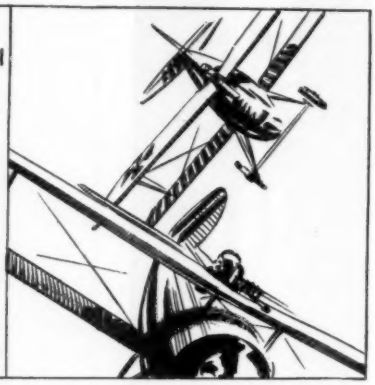
Fig. No. 1 Preparing rocket No. 1 for its initial flight from the launching stand

Heroic Exploits of Aviation

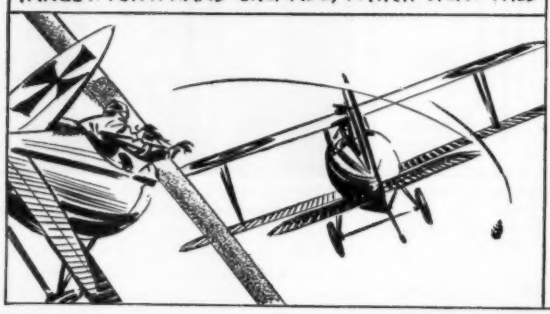
FLYING SINGLE PATROL INSIDE THE GERMAN LINES BETWEEN RHEIMS AND MACHAULT, **BERT HALL** MET A FAST, NEW-TYPE ENEMY AIRCRAFT



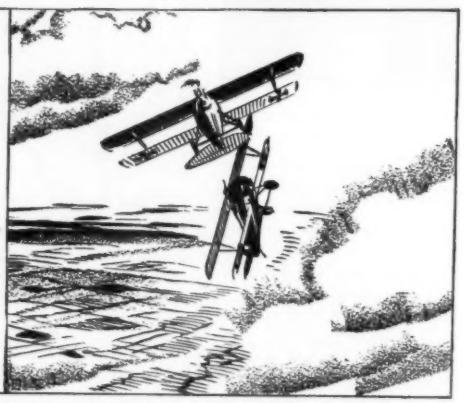
HE PLAYED AROUND WITH HIS FIND, AT 14,000 FEET, AND DISCOVERED THAT THE GERMAN COULD FLY RINGS AROUND HIS 13-METER NIEUPORT



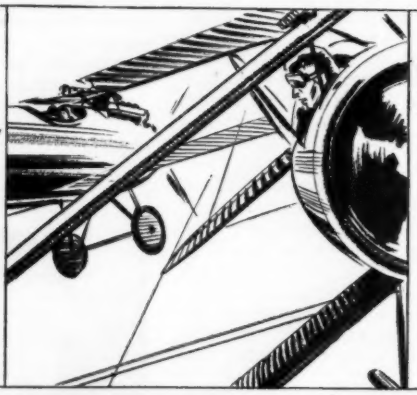
SUDDENLY THE GERMAN BANKED NEATLY, AND THE ASTONISHED BERT FOUND HIMSELF THE TARGET FOR A HAND GRENADE, WHICH WENT WILD



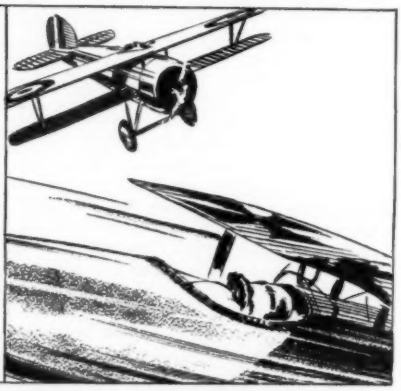
BERT HAD SEVERAL OPPORTUNITIES TO BLAST HIS FOE OUT OF THE SKY, BUT HIS CURIOSITY, FOR THE MOMENT WAS STRONGER THAN HIS KILLER INSTINCT /



HE SAW THE GERMAN PULL THE FUSE PIN OF ANOTHER GRENADE, WHEN SUDDENLY HIS HEAD DISAPPEARED INTO THE COCKPIT, AND HIS PLANE FELL OUT OF CONTROL

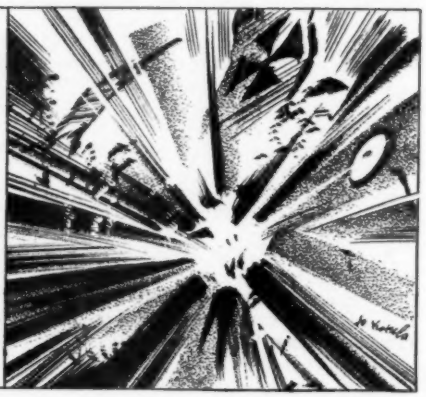


BERT QUICKLY SIZED UP THE SITUATION HE HADN'T LONG TO WAIT FOR DEVELOPE-MENTS /



THE PANIC-STRICKEN GERMAN REALIZED THAT THE GRENADE HE HAD FUMBLED WOULD SEND HIM TO HIS DOOM IN A FEW SECONDS IF HE DID NOT RECOVER IT. WHEN HE SAW THAT HE COULD NOT REACH IT, HE STOOD UP /

A SECOND AFTER HE SALUTED, THE EXPLOSION WROTE THE FINALE TO ONE OF THE MOST UNIQUE AERIAL ENCOUNTERS ON RECORD



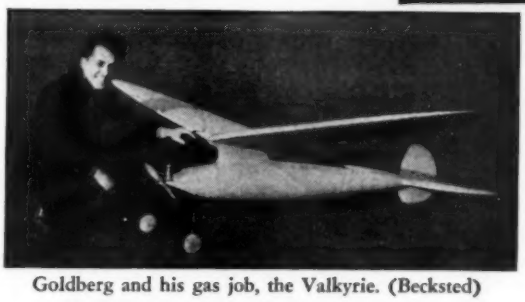
How Much Gas?

Virtues and Faults of Various Systems of Fuel Allowance for Gas Models and How the Flights of Such Planes Are Affected

By CARL GOLDBERG

Mr. O. Bergman and his Forster-powered "Flying Quaker"

THE advent of gasoline-powered model airplanes has brought a peculiar problem to the attention of those contest directors who seek to establish equitable rules for the conduct of competitive meets. The basic idea in contests for rubber-powered models has been to select the winner as the one which achieved the greatest endurance. Each contestant strained his model to the utmost. He used as much slack rubber as the ship could manage, and wound to the limit with the knowledge that the motor would be unwound after a climb of a few hundred feet; from then on, it was all up to the glide and air currents. But gas models can have a motor run of hours at a time, and climb thousands of feet. In 1934, Maxwell Bassett put thirteen ounces of gas in his six foot model, and it flew for two hours and thirty-five minutes, circling over three states and covering fifty-two miles in a straight line from the point of take off. The motor ran for two hours and fifteen minutes and pulled the model to a height of 8000 feet. A lightplane was used to follow the model.



Goldberg and his gas job, the Valkyrie. (Becksted)

Beyond a doubt, this record would soon be exceeded if competitions were conducted on this basis. Equally beyond a doubt, such competitions would be extremely difficult to run, and beyond the power of the present interested groups. As a natural result of these obstacles, the matter of fuel allowances has been discussed pro and con for the past several years. Various groups and individuals within groups, have been pulling different ways, each attempting to impress the rest with his own pet idea. Let's take a brief look at the major suggestions.

Carl believes in streamlines. (Becksted)

First, of course, we have the rule established by the National Aeronautic Association, and which is the one most widely used at present: one-eighth ounce of fuel per pound of model weight, with a maximum permissible weight of seven pounds. A modified version of this method is one-sixteenth ounce per pound.

A. Soloman's Quaker in flight. (Covington)

Next, we have the system employed by the American Legion in its annual meet at Indianapolis; one ounce per twenty cubic centimeters of piston displacement.

Third, a method employed by Central Gas Modelplane Society and other organizations: 45 second motor run, limited by automatic timer.

Fourth is a combination of judging for appearance (such as is used for scale models), precision flying, duration flying, with a limited amount of fuel, such as was used at the Gotch Airport meets. Here, duration counted for only about 20% of the maximum possible points.

Fifth is the precision control method proposed in England. The ship is first made to circle to the left and land as close as possible to a given spot. Then it is circled to the right, and so on through various maneuvers.

Many other methods have been proposed besides those given here, and it must be admitted that some have considerable merit. But nevertheless, of all the ideas hitherto given publicity, the ones listed above are acknowledged to have the largest groups of supporters. Now let's try to analyze them.

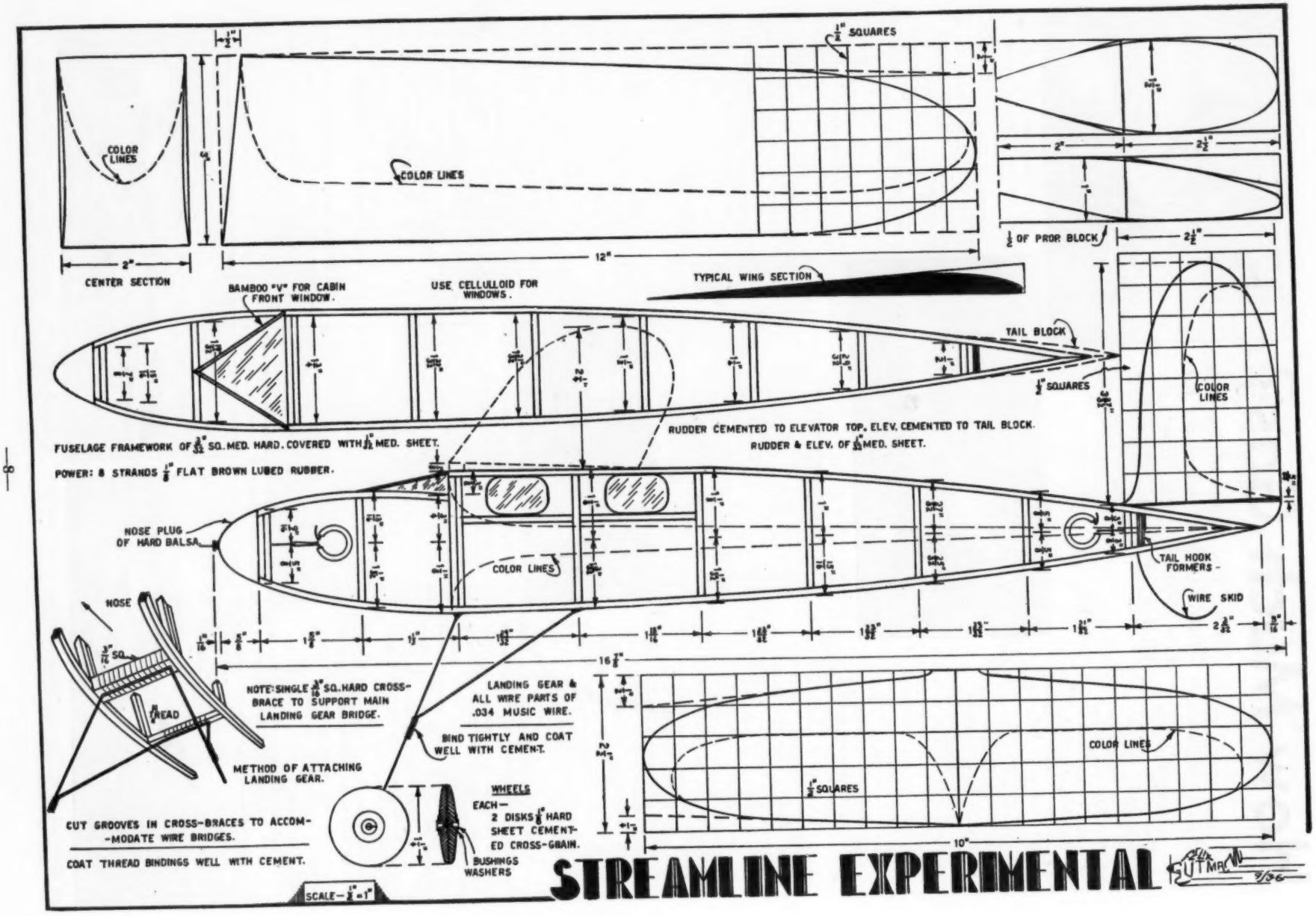
The NAA rule of ⅛ ounce per pound apparently places a premium on high weight. For example, imagine two ten foot models, one weighing three pounds, the other six pounds, and powered with the same make of motor. The heavier model would have half the rate of climb of the light ship, but since the motor run would be doubled, it would eventually get up to about the same altitude. Assuming other things to be equal, the sinking speed of the heavier model would be quite a bit greater than that of the other. Consequently, the advantage of the longer motor run would be cancelled in the end. From this, then, we can conclude that the NAA rule does not actually benefit heavy models very much if at all.

However, there is still a strong argument against this sort of rule. We all know that one of the major problems of aviation is to produce the lightest possible structure to do the job well. It is extremely difficult to

(Continued on page 40)

Leo Vartanian's fine 7 ft. job "taking off." One of the best in Chicago area. (Courtesy Dr. George Covington)

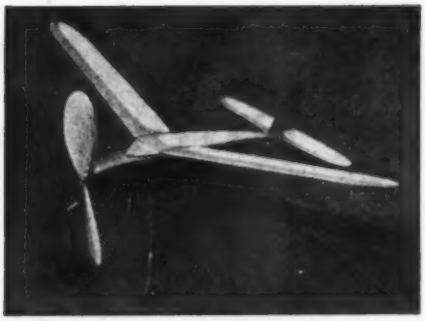
Busy members of the Gas Model Aeronauts Club of Chicago, Ill. Joe Konefes in the background. (By Joe Trefny)


COLOR LINES
2"
CENTER SECTION
COLOR LINES
12"
1/4" SQUARES
2"
2 1/2"
1/2 OF PROP BLOCK
2 1/2"
TYPICAL WING SECTION
BAMBOO "V" FOR CABIN FRONT WINDOW.
USE CELLULOID FOR WINDOWS.
TAIL BLOCK
1/4" SQUARES
COLOR LINES
FUSELAGE FRAMEWORK OF 1/32" SQ. MED. HARD. COVERED WITH 1/32" MED. SHEET.
POWER: 8 STRANDS 1/8" FLAT BROWN LUBED RUBBER.
RUDDER CEMENTED TO ELEVATOR TOP. ELEV. CEMENTED TO TAIL BLOCK.
RUDDER & ELEV. OF 1/32" MED. SHEET.
NOSE PLUG OF HARD BALSA
COLOR LINES
TAIL HOOK FORMERS -
WIRE SKID
16 7/8"
NOSE
3/16" SQ.
THREAD
METHOD OF ATTACHING LANDING GEAR.
NOTE: SINGLE 3/16" SQ. HARD CROSS-BRACE TO SUPPORT MAIN LANDING GEAR BRIDGE.
LANDING GEAR & ALL WIRE PARTS OF .034 MUSIC WIRE.
BIND TIGHTLY AND COAT WELL WITH CEMENT.
CUT GROOVES IN CROSS-BRACES TO ACCOM--MODATE WIRE BRIDGES.
COAT THREAD BINDINGS WELL WITH CEMENT.
WHEELS
EACH— 2 DISKS 1/8" HARD SHEET CEMENTED CROSS-GRAIN.
BUSHINGS WASHERS
SCALE— 1/4" = 1"
1/4" SQUARES
COLOR LINES
10"
STREAMLINE EXPERIMENTAL
SUTMA
3/36

An Experimental Flier for Novice or Expert

Here's One of the Most Reliable All-Balsa Fliers That You Have Ever Built—Graceful and Easy to Construct

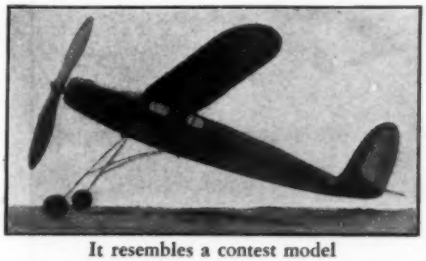
By FELIX GUTMANN



The large "prop" gives real performance

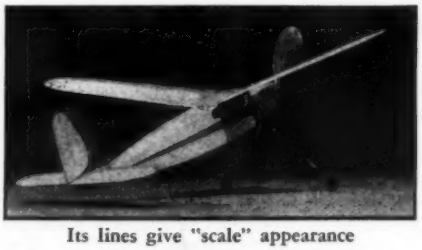
HERE is a model where looks and clean lines count as much as good flying ability. It is very sturdy and a hard one to wreck. This is due mainly to its all-balsa construction and the use of the proper grades of balsa throughout. The original model had a wing loading of 1⅓ ounces per 50 square inches of wing area, which is quite high. Despite this fact it flew as if it were of ordinary built-up and tissue-covered construction, but naturally would fly in winds prohibitive to the latter type plane. If the builder wishes to reduce the weight of the model, he may leave off the decorations (shown also on the plan) for which ⅔ ounce of colored dope was used. Doing this of course takes away part of the "eye-catchiness" so desirable in a ship. Builders who feel ambitious enough and wish to have just a fair weather flier should build up the wing and possibly the tail with ribs and spars, and use tissue for covering. Builders who would like a 39" model instead of one with a 26" span should multiply the dimensions on the plan by 3/2 when scaling it up.

If the builder does decide that he wants to decorate the ship, he should paint it before the wing and tail sections are cemented together. It is advisable to use Scotch cellophane tape for the striping.



It resembles a contest model

Reaching for the clouds



Its lines give "scale" appearance

Construction

Wing

The wing is cut from 3" wide triangular glider wing stock or from medium 3/16" wood, preferably the former. ⅛" stock may also be used. The shape may be laid off right on the wood, except the tips. For these a pattern must be made. Use a piece of smooth cardboard 3" x 3½". Lay off a series of ½" squares corresponding to those shown on the plan. Now lay off a series of dots on the sides of the squares corresponding to the sides of the squares on the plan through which the outline of the tip passes, making sure that the dots are at a distance from one end of the line proportional to the corresponding distance shown on the plan. Now connect the dots either carefully free-hand or with a drawing curve. The outline is then cut and traced on the wood. For the other tip turn the pattern over and trace. The outline may now be cut and the wing section carefully formed. Note the center section of the wing has the ends inclined for the dihedral of 2¼" to be put in the wing after it is finished with 10 nought sandpaper and two coats of banana oil.

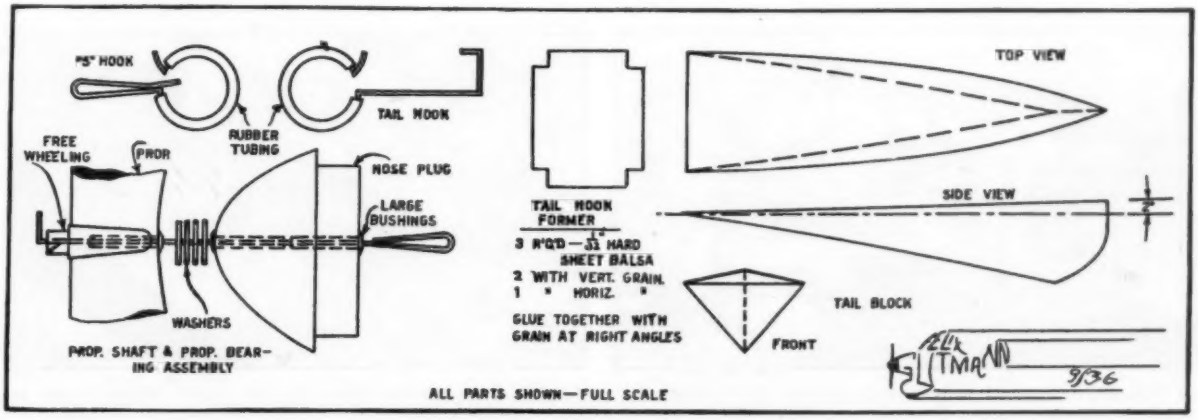
Tail

The tail is made from 1/32" medium hardness sheet balsa. The outline is obtained in the same manner as the wing tips, by patterns. The tail is also finished with 10 nought sandpaper and given two coats of banana oil with intermediate sandings. The rudder is cemented to the top of the elevator.

Fuselage

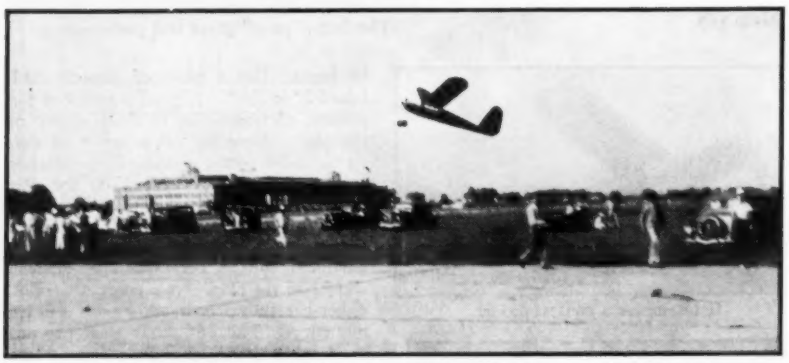
Only the fuselage side need be drawn over. Get a piece of paper longer and wider than the fuselage and draw a center line which is 16⅞" long. Next lay off all the longitudinal dimensions, that is, the distance between all the vertical cross-braces (shown directly under the side view.) Next lay off all the vertical dimensions at each station starting from the center line.

(Continued on page 40)



National Aeronautic Association Junior Membership News

Prepared by National Aeronautic Association, Dupont Circle, Washington, D. C.



Bernarr Anderson's gas job gets off for a long flight. The hangar and field headquarters appear in the background.

The Complete Story of the 1937 National Model Plane Contest at Detroit, Mich.

THE Nationals, the model airplane classic of America, is now history. 500 boys from nearly every community in the United States traveled to Detroit to meet on July 7th at the Hotel Fort Shelby, Detroit, Michigan. On the first day of the contest the boys were busily registering and preparing their ships for the events which took place on the four following days. It is very difficult to picture the excitement and the individual interest of each boy. One has to see the operation of a large contest in order to appreciate it.

On Thursday, July 8th, the Mulvihill, the Stout and the Moffett eliminations were held. These were all rubber events.

On Friday the indoor events were scheduled. These included the Stout indoor stick model events and the Bloomingdale cabin event.

On Saturday the Dupont gas model events were held. It had been planned that the Dupont events would be run off at a special contest which was to be held at Elmira, New York, during the soaring meet. However, the date of this contest would have conflicted with the Nationals so the Dupont contest was combined with the Nationals at Detroit in order to allow the model builders to compete in both the Nationals and the Dupont contest. The events on Saturday included a duration event with a maximum motor run of 30 seconds, also a payload event with a maximum motor run of 30 seconds. In the latter, the contestants were allowed to increase the weight of their models to 7 lbs. maximum. Points were figured by means of a special formula which included the weight of the model and the duration of flight.

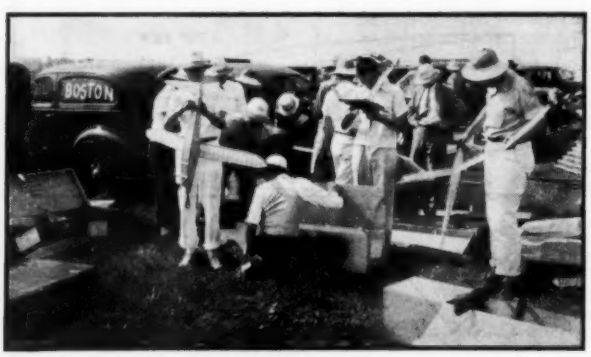
On Sunday the Texaco classic was held. This event has been run for the last six years in which the boys fly for maximum duration using ⅛ oz. of fuel for every lb. of weight of model.

Only outdoor events were held at the Wayne County Airport, which is located about 23 miles from Detroit. Busses transported the fliers from the Fort Shelby Hotel to the field where they were busily engaged all day in struggling for the honors to be awarded. The indoor events were held at the airship hangar at Grosse Ile. Last year the indoor events were held at Convention Hall. However, it was thought that the airship hangar provided more space and better flying facilities.

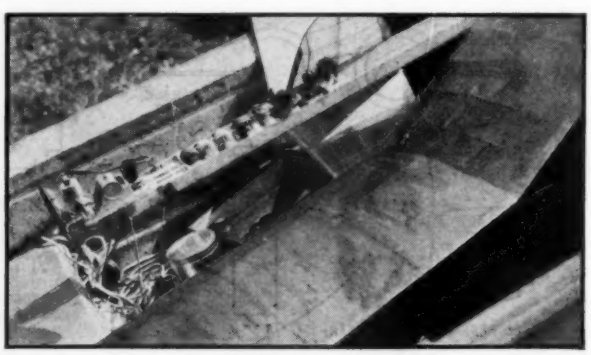
One of the new features of the 1937 contest was the radio controlled gas model event which was held on Sunday.

The first day of the contest dawned with clear weather. At the field the contestants were greeted with a hot spell which was to last for the remainder of the Nationals. This provided fine air conditions for all flights. Many thermals existed on the field.

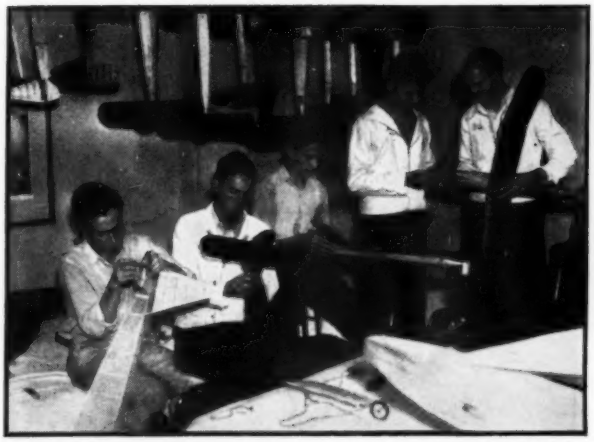
Alvie Dague, of Tulsa, Oklahoma, carried off the Mulvihill trophy and the Syncro Ace engine, which were given as awards. His time was 33 min. 2 sec. Jim



16 high powered model builders from Boston, Mass., under the leadership of G. Munnick of Quincy, Mass.



Chester Lanzo's radio controlled gas model before it was assembled. It weighed 5¾ lbs. and was 9 ft. in span.



Tulsa, Okla., group, preparing for next day's events. L. R. Hoffman, Wriston, Bateman, Dague, Lockett. Dague won the Bloomingdale and Mulvihill events and placed 2nd on Wakefield team

Toronto model builders descended on the contest en masse. Standing, L. R. Dolsen, Millgan, Dilly, Barrce, Smith, Batchelor. Kneeling, Anthony, Bowes, Harris, Lucas

Cahill, of Indianapolis, who is well known among model builders as a consistent winner, won the Moffett trophy and a Model Airplane Year Book, with the time of 15 min. 45.1 sec. Richard Korda, of Cleveland, Ohio, won the outdoor cabin event, open class, with the remarkable time of 50 min. 13 sec. For this he received the Exchange Club Plaque and a Year Book. In the Stout outdoor cabin event, Roy Stoner, of Rockford, Illinois, flew for 12 min. 52.2 seconds, carrying off the Stout Perpetual Trophy, an Ohlsson engine and a 1000 mile trip on the United Air Lines. He also received a Year Book. Bernarr Anderson, of Akron, Ohio, won the outdoor stick event in the open class. His flight of 12 min. 52 sec., won the Balfour Perpetual Trophy, the Warner Aircraft Permanent Trophy and a Year Book.

Remarkable times were made on flights indoor. In the indoor stock model open event for builders over 21 years of age, Thomas Harris, of Toronto, Ontario, came first with a flight of 20 min. 37 sec. For this he received the Springfield Perpetual Trophy and the Model Aircraft Year Book. Wallace Simmers, of Chicago, flew his Stout indoor stick model for 21 min. 30 sec., winning the Stout Perpetual Trophy, a Syncro Ace engine, a round trip to Washington on the Pennsylvania Central Air Lines and a Year Book. The Bloomingdale Perpetual Trophy, an Ohlsson engine awarded by Dellaire, a round trip to Washington by air and a Year Book went to Alvie Dague, of Tulsa, Oklahoma, for winning the indoor cabin Bloomingdale contest with a time of 15 min., 41 sec.

In the indoor cabin open event, John Ginnette, of Atlantic City, flew for 17 min. 48.6 sec. He was awarded a John Kay Propeller Clock and a Year Book.

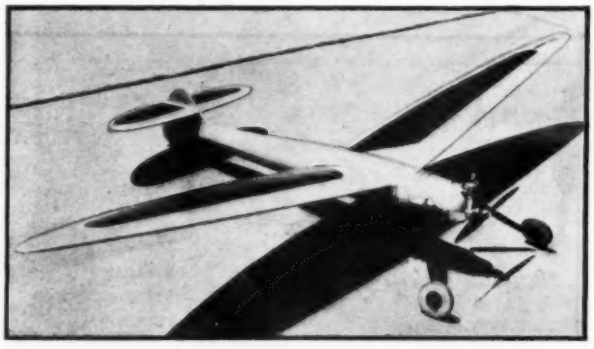
The Richard Dupont Trophy was won by Albert P. Dillon, of Jackson, Michigan. He scored 114 points. He was also awarded a cash prize.

One of the events which brought out the art of gas model building to a high degree was the Berryloid contest. The Berryloid Trophy was awarded to the builder of the gas powered model on which was the finest finish. Alvin Anderson, of Chicago, Illinois, won this event hands down. His ship was a beautiful mid-wing type with a high gloss finish on the silk covered part as well as on the wood structure of the ship.

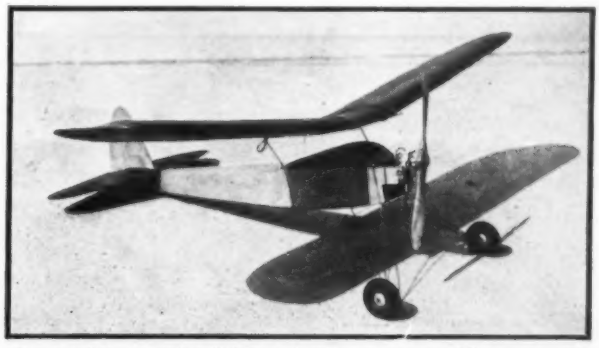
On Sunday the model builders were delayed in getting started on their contest activities because of Old Man Weather. Many of the boys awoke—or should we say were awakened—about 6:00 to 6:30, by a violent thunderstorm. Many of them went back to sleep thinking that the events of the day would be postponed until Monday, in fact this procedure was not confined to the contestants for several of the directors did the same thing. Fortunately, the bad weather didn't last very long and the sun came out to produce unusual thermal conditions on the field. The events were in full swing by 11:00 o'clock, which were by far the most exciting of any staged at the Nationals.

Due to the longer engine run which is allowed in the Texaco event, than the 30 seconds specified for the contestants on Saturday, the time of the flights were increased considerably. Nearly every model that gained even slight altitude flew out of the field. As many as ten ships were in the air at once. Most of these ships reached an altitude of over 1000 feet and as many as thirty flew out of sight entirely. Some of them landed in Canada, across the Detroit River. Outstanding flights were made by Maxwell Bassett, Carl Goldberg, Bernarr Anderson, Fiske Hanley, Michael Roll and Merrill Malley, and there were many others whose flights were most unusual. They may be judged by the time in the complete list of contestants given toward the end of this article.

We should not forget the scale model builders. Eleven fine models were entered which were exhibited in the exhibition room at the Hotel Fort Shelby. Max Sokol, of 111538 Dequindre Street, Hamtramck, Michigan, won the contest



Alvin Anderson's Berryloid contest winner. A spring cantilever landing gear was a feature of this plane



Frank Ehling's "Mulvihill" and "Stout" entry. The removable cabin made its participation in both events possible

Don Donahue, all the way from Los Angeles, Cal., who placed third in the indoor cabin open event

John Gennette and his ship which won 1st place in the indoor cabin open event

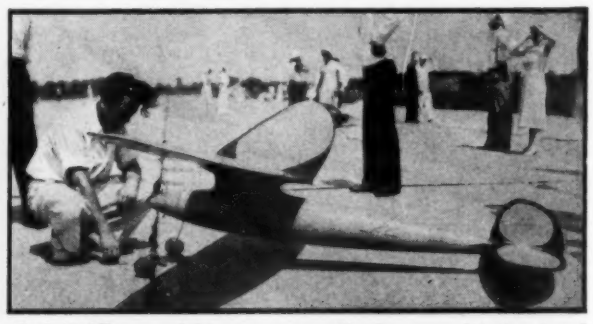
with a most remarkable Stinson Reliant. He was awarded the MODEL AIRPLANE NEWS Trophy and Berry Bros. Trophy for the best finished model. His model was unusual in as much as it carried off both trophies. Peter Zaleski, of 3516 East 74th Street, Cleveland, Ohio, won second place and a Macon Reese award with his Curtiss Dirigible Fighter F9C2. The engine on this little ship was the most remarkable piece of work in the contest. One had to see it to appreciate it. On both of these ships every detail of control was present. It appeared that these young men must have used a magnifying glass to reproduce the instruments which appeared in the cockpit. It is difficult to believe that they could have been created otherwise. Judges of this contest were D. Althouse, George Tabraham and Charles H. Grant.

One of the unfortunate incidents that usually occur was present in this contest. Harry Walker, of Cleveland, submitted a Boeing P12E without drawings. It was required to submit the drawings from which the models were made in order that models might be checked against the drawings for accuracy to scale. Without question, this model would have received at least second place had Walker conformed to the rules. The judges recommended a special consolation prize because of the high quality of the model.

It is impossible to describe the many highlights of the meet at great length. A few of the outstanding ones, however, cannot be overlooked. There were many new ideas. However, the most perfect example of a new feature which was highly developed was a steam-driven model. The model itself was a miniature monocoupe of about 40" wing span. Strange to say, though it was one of the first steam driven models it could not be classified in the experimental stage. It was powered by a small 3-cylinder engine. The bore of each cylinder was about 5/32. The steam was generated by means of a flash boiler using canned heat as fuel. Canned heat was used because of its solid nature. Thus when the model assumed various altitudes or performed unusual maneuvres in flight, the fuel would not slop around the fuel container or cause any variation in the flame generating the same. The whole engine, boiler included, was not over 6" long. It was about 2" in diameter. This plant drove an 8" propeller at about 3000 R.P.M. The model flew beautifully, and after seeing this model one cannot help but realize that there is a field for a steam driven model airplane. Very little experimental work has been done along this line. However, the results obtained are most promising.

The event which held the interest of the crowd to the fullest extent was the radio controlled gas model event. About six ships were entered. Chester Lanzo, of Cleveland, Ohio, won the MODEL AIRPLANE NEWS Perpetual Trophy, Ed Roberts Trophy and an Ohlsson engine by making a flight which indicated his ability to control the ship in at least one direction. Only three ships got off the ground. Two of these crashed at the take-off. The others, possibly very wisely, did not attempt to fly. Lanzo's plane was a simple stick model which was equipped with a wing very similar to Maxwell Bassett's. This ship was the least elaborate entered in this event. However, the prize was not given for the quality of ship but for the quality of control indicated by the action of the ship in response to the radio transmitter. Pat Sweeney, of Chicago, Illinois, had an exceptionally fine plane. However, due to poor adjustment of the ship, it crashed at the take-off.. He won the A-C Spark Plug Trophy which was given for second place. The third place was

Charles Martin and his gas job. This ship is an excellent design and beautifully finished



Carl Goldberg and his super-streamlined gas model that hated to come down when once in the air

Wallace Simmers and his indoor stick model that placed first in the senior event

The indoor contest in full swing at the Grosse Ile dirigible hangar

won by Elmer C. Wasman, of Jacksonville, Florida. He received The Flying Aces Trophy. Walter Good, of Brooklyn, New York, won the Taylor Young Trophy. Undoubtedly Good had an airplane which would have operated properly. However, he consumed so much time in preparing his ship that the contest was closed before he had a chance to fly. Leo. Weiss, of Brooklyn, New York, exhibited a ship which was a marvel of construction. However, it is questionable whether or not this ship would be stable enough for successful radio control operation. He received a rifle and an Exchange Club medal.

The fact that made itself most evident in this contest was that the contestants had not fully developed their apparatus. As usual, too little time had been allowed for experimenting, building and testing their entries. This condition is true in nearly every case where new developments are presented for the first time.

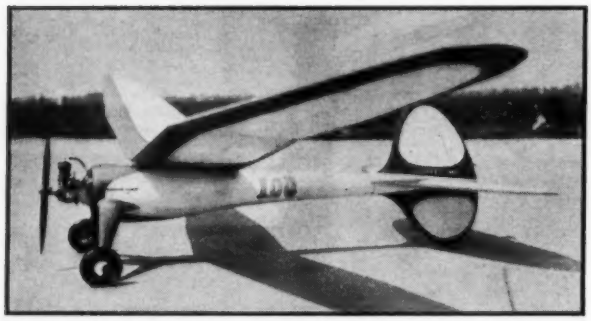
One of the interesting features of the event was, that no two similar methods of radio control were present in any of the ships. Every contestant had worked out an individual manner of operation. Elmer Wasman's plane received the unique name of "The Flying Windmill" because of the small Servo propeller which was attached to the plane immediately in front of the fin. When the ship was in flight, the air stream turned this propeller which was attached to a series of miniature dynamos. In this manner current was generated for the operation of solenoids. Though Byron Schiff, of New York City, did not enter a radio controlled plane, he provided an unusual display with an autogiro (so-called). Actually his ship was an ordinary low wing gas model with an arrangement of autogiro vanes located in the usual position about the fuselage. As in previous cases, the vanes hindered the flight rather than helped it. They actually didn't function as vanes. The ship was launched with a violent push. As might be expected, it stalled, slipped to one side and crashed so that the vanes were entirely removed from the plane. Apparently this was all that was necessary in order that the ship would be capable of flight, for after clearing the remaining debris from the structure of the plane, Schiff proceeded to fly his ship without the vanes as a gas model. Under these conditions it performed perfectly.

Carl Goldberg's entry in the Texaco event created a great deal of interest not only because of Carl's history and reputation as an indoor builder but because of the unusual design of his first attempt at a gas model. As every one knows, it requires very fine technique to build indoor models. It is practically a watchmaker's task. Carl applied the many lessons that he has learned in this branch of the art to his gas model construction. Aerodynamically, his ship was perfect. It consisted of a cigar shaped fuselage of monocoque construction. The wing was parasoled above the fuselage. This was of elliptic shape and employed an original wing curve. The ribs of the wing were not exceedingly deep though the ship had a high upper camber. This was due to the high under camber used which gave the ship a very slow flying speed and unusual floating qualities. On several occasions the ship on the glide drifted across the field without losing altitude to any appreciable extent. It gave nothing short of a remarkable performance.

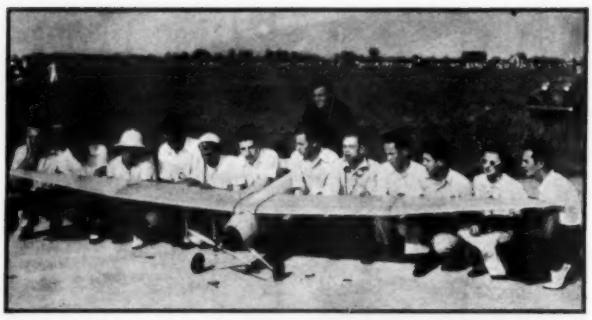
It was hoped that the flying scale model event could be developed as a per-

Leo Bailey and his Corbin Super Ace flying scale model which placed first in this event

H. G. Harris of Toronto and his indoor stick model which captured 1st place in the open event



A gas model of most unique design by C. H. Siegfreed of Kansas City, Mo.



Look at the size of Leo Weiss's radio controlled gas model. Weiss stands at the tail

manent one of the Nationals so one was incorporated in this contest. It was rather a disappointment insomuch as only two planes competed and gave a very mediocre performance. Leo Bailey, of Akron, Ohio, won first place. He was awarded a GHJ gas engine given by the William O'Neil General Tire & Rubber Co. Frank Franz, of Detroit, Michigan, won second place, receiving the Stinson Medal given by the Stinson Airplane Corporation.

Great attention was focused on the Moffett event insomuch as the six highest qualified as contestants in the Wakefield International Event. Jim Cahill, of Indianapolis, won the Moffett and headed the list as Wakefield contestants. The six highest place winners of the Canadian team in the Moffett event were to be sent to the Wakefield as Canadian representatives.

One of the highlights of the boys' stay in Detroit was the meeting of gas model leaders which was held on Friday night. Several members of the Department of Commerce were present to investigate the possible dangers to property and persons that might develop from model flying. This meeting was prompted chiefly by the fact that attempts had been made to ban gas models. The members of the committee presented their views on this subject in a most enlightening and interesting manner. Among those present were: Mr. William Enyart, Secretary of the National Aeronautic Association; Colonel Floyd E. Evans, who acted as chairman of the meeting; Mr. H. M. Jellison, of the Akron, O., Dept. of Education; Mr. Pat Sweeney, of the Central Gas Model Society, of Chicago; Mr. Charles Grant, Director of the International Gas Model Airplane Association; Mr. Robert Allen, Pennsylvania Director of the I.G.M.A.A.; Captain Willis Brown, Adviser of the Boston Gas Model Society; Mr. Frank Tlush, an expert on gasoline engines; Mr. Edward Roberts, President of the Brown Junior Motors Corporation; Mr. Al. Lewis, a leading editorial light in the aviation field from Boston; Mr. Frank Zaic; Mr. Frank Lucas, from Canada; Mr. and Mrs. Stoffer, gas model enthusiastics of the Chicago Aeronuts; Mr. Nathan Polk, Field Director of the I.G.M.A.A., and Mr. Irwin Polk, Director of the Metropolitan Model League, New York City. There were also a number of other personalities of importance in the model field.

The meeting served as a real course in aeronautical education, and from the expressions of interest made by the Department of Commerce officials, it is believed that they gained a very clear picture of this activity. These officials were present at the meet and observed the manner in which it was conducted, after which they made favorable comment. Because of this, we believe that few, if any, restrictions will be placed on gas model flying.

On Friday contestants were invited as guests of the amusement park at Jefferson Beach. This served as a relief from their concentration on preparing their models for the contest

Another highlight was the Edward Roberts special event. Mr. Roberts gave a trophy for the greatest advancement in gas model construction and design.

By Sunday night the events had all been run off so that on Monday the contestants were able to take advantage of Mr. Ford's offer to visit his plant and Greenwich Village.

The crowning event of the contest was the dinner held on Monday night at the Ford Motor Co. Administration Building. Great appreciation is extended to Mr. Ford for supplying this very essential factor of all national contests. Needless to say, the dinner was enjoyed by all. Afterwards the prizes were distributed and many appropriate and humorous comments were forthcoming from Mr. Swanee Taylor, who introduced the speakers. The meeting was addressed by Mr. William Cameron in a most appropriate manner. Mr. Cameron is well known for his talks over the radio on the Ford Sunday Hour. He emphasized the manner in which model activity was building up character in young men and preparing them, psychologically as well as in an educational sense, for success in life.

(Continued on page 61)

Herbert Fish who won the Moffett contest and placed 1st on the Wakefield team

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NATIONAL AERONAUTIC ASSOCIATION OF U.S.A.

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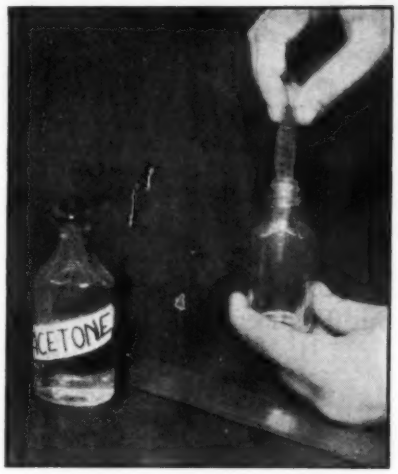
How to Make Your Own Cement



By JOHN C. SYBENGA

DURING the construction of model airplanes, especially the detailed and intricate ones, I have found that a very large amount of ambroid, or the balsa cement will be used. Having run out of the ambroid at a crucial moment more than once, I devised a cement that works every bit as good as the commercial grades, and is much less expensive. The materials can be purchased at very little cost, and only a few moments is needed to make it.

All you need is an ounce or two of acetone, a liquid chemical that may be purchased at any drug store for a few cents an ounce, and a little piece of pure celluloid, obtainable from most any source. By removing the emulsion from Kodak films, or a strip of movie film with hot water, a very fine grade of celluloid can be obtained. To prepare the ambroid, simply dissolve enough celluloid cut in narrow strips or rolled up, in an ounce of acetone until the mixture becomes thick and syrupy. This will take but fifteen or twenty minutes, depending upon the amount of agitation. A few drops of camphor will improve the cement. It is now ready for use, and a joint made with it will last indefinitely. Keep bottle tightly corked.

Dope may be made in the same manner. All that is necessary is to add more acetone until the desired degree of thinness of the solution is obtained. Adding a few drops of ether will make it dry quickly.

The picture illustrates how the film is dissolved in acetone

Now You Can Check That Line of Thrust

By RAYMOND F. SANTEE

MUCH has been said, and many methods offered in regard to test hopping "gas jobs." The best way to eliminate crackups on the maiden voyage is to abolish as many hazards as possible while the ship is still in the workshop, *then* test hop it. A ship that is designed correctly, built carefully and checked often will seldom let its builder down.

To describe all three of these steps would take many pages, therefore, it is the purpose of this article to show one good method of checking a gas job before flying it. For the sake of space and time we will assume that the reader has just finished a beautiful ship, and he now wants to hop it in the safest possible manner.

All of the settings of stabilizer and wings as well as the rudder are based on the line of thrust. It is due to error in said L. of T. that many ships come to grief. Some builders prefer down thrust while a large percentage of builders still use straight or O degrees thrust. All argument seems to favor O degrees thrust, but be that as it may, no matter what degree of setting is used in installing the engine, the stabilizer is set in regard to THIS ANGLE. When the builder uses down thrust he merely uses one setting to achieve another setting of the stabilizer. It can be seen how necessary it is to know *exactly* at what angle the engine is mounted. When this is determined the other positions can be determined on paper and the gas model adjusted accordingly. By checking the line of thrust frequently and especially after any crash, you can adjust your engine in your ship so that poor flights will be reduced to a minimum.

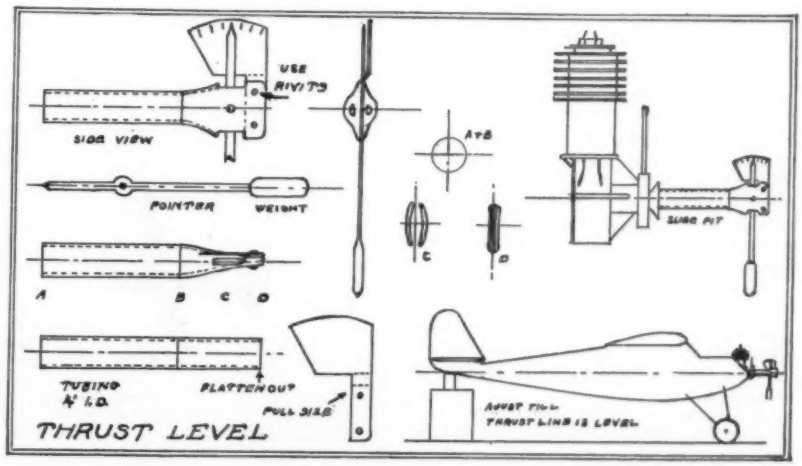
Perhaps the reader now asks, "How can I be positive my L. of T. is exact? How can I measure it IN DEGREES AFTER the ship is built and the engine already installed?" "Necessity is the mother of invention," so the author devised the following simple gadget to do the job. It can be built in an hour for a few cents and will prove itself worth its weight in gold.

The only materials needed will be a piece of aluminum tubing with an inside diameter the same size as the crankshaft of your engine, a few small strips of brass about the thickness of writing paper, several small brads and solder.

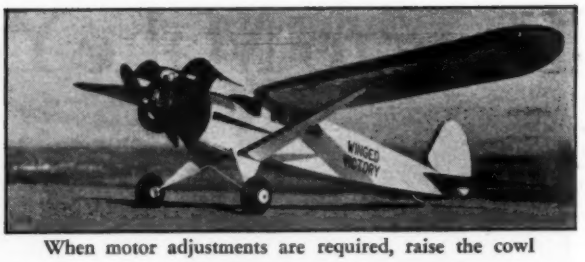
Construction

Cut the aluminum tubing to a length of about two inches. Three-eighths of an inch from one end of the tube drill a hole (about 1/16") through both walls. Use a jeweler's saw to lengthen the hole to three-eighths of an inch. If no jeweler's saw is handy several holes in succession may be drilled and smoothed with a file. These two slits will be on the top and bottom of the tube. Insert a drill shaft or dowel in the long end of the tube one inch to preserve the round shape of this end, then hammer the sides from section B-B flat to the end of the tube. Do not completely close the tube. Leave about 1/16" clearance. Measure half-way down the side of the tube at C-C and drill a hole the size of one of the brads. Make a dial of the brass from the pattern in the drawing. Insert the "leg" of the dial in a 3/16" split in the end of the tube and hammer the end shut. A face dial may now be made of white paper laid off with a protractor and cemented over the brass dial. The needle is made from sheet brass and the measurements can be taken direct from the full size drawings. The hole should be the same size as the one drilled in the tube for the brad. Run one of the brads through the hole and work it until a good, free turning fit is secured. With a soldering iron run a little solder on the long end to give it weight. The hand may be smoothed with a file. Stick the needle through the

(Continued on page 64)



The miniature airplane ready to go through its paces



When motor adjustments are required, raise the cowl

A Precision Contest Gas Job

How You Can Construct a Small Realistic Gas Model That Has a Comparatively Slow Speed But High Consistent Performance

By ELBERT J. WEATHERS

Part No. 1

AS GENERALLY acknowledged, the Precision-Type Gas Model Contest is fast becoming standard, with purely durational meets now practically a thing of the past. Any conscientious builder, upon entering this more scientific type of competition, is immediately impressed with the new phases of judging his model, with engineering, construction and workmanship sharing with points awarded through actual flight of the plane. The writer is pleased, therefore, to offer the gas model enthusiast this ship, of original design, which will ably meet every requirement for this type of contest. The generally used point system in the precision contest is as follows:

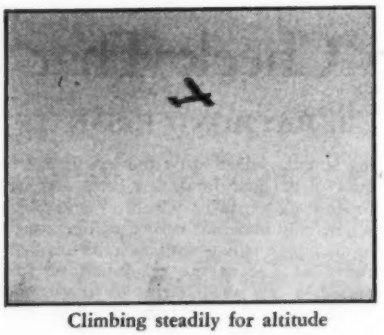
A. Engineering (20 points—Maximum)
   1. Design
   2. Construction
   3. Workmanship
B. Take Off (20 points—Maximum)
   1. Take off
   2. Duration
   3. Approximate distance
   4. Altitude
C. Flight (25 points—Maximum)
   1. Stability
   2. Performance
D. Landing (35 points—Maximum)
   1. Approach
   2. Attitude as to landing position relative to restricted landing area of field

Total possible points—100

It should now be quite evident to any builder, heretofore unaccustomed to the precision meet, that the many "breaks" usually obtained by the favored few in strictly durational meets are cut to a minimum. Another phase of duration contests, that of the stubborn element of gas jobs flying out of sight and becoming lost, is entirely eliminated. The most important feature is the way in which this kind of competition literally "forces" design and workmanship advancement out of gas model builders, a fine feature which durational meets cannot generally claim.

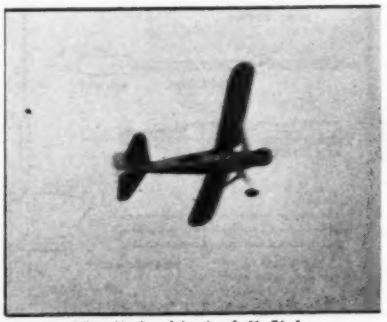
Most precision meets allow two official flights, each being the usual limit of 45 seconds, or less, of the engine operation. As will be noted, this ship is equipped with a very efficient flight timer for this purpose.

Before going further, the writer would like to take this opportunity of expressing his complete satisfaction as a result of employing the X.G. aerofoil in this design, developed by Mr. Charles H. Grant and previously proven so successfully on the famous KG gas job. This has primarily kept the speed down to a conservative rate for this size model and engine power (5 ft. wing span—1/6 hp. engine.) It also offers a steep angle of climb which is most important in flying this model in the precision-type contest, provided it stays over the field through proper circling adjustment. The glide is also benefited to a great extent by this wing section. Other design factors advocated by Mr. Grant have been incorporated in this design, all contributing greatly to the flight ability of the plane.



Climbing steadily for altitude

This gas model uses the Bunch Engine, although similar engines of 1/6 to 1/5 hp. can be used, provided the motor mounting plates and cowling holes are re-styled slightly. The wheels used on the original are Ohlsson Streamlines, but any of similar diameter (3½ inch) will be satisfactory. Take ample time to build all units as construction and final finish are important factors.



The little ship in full flight

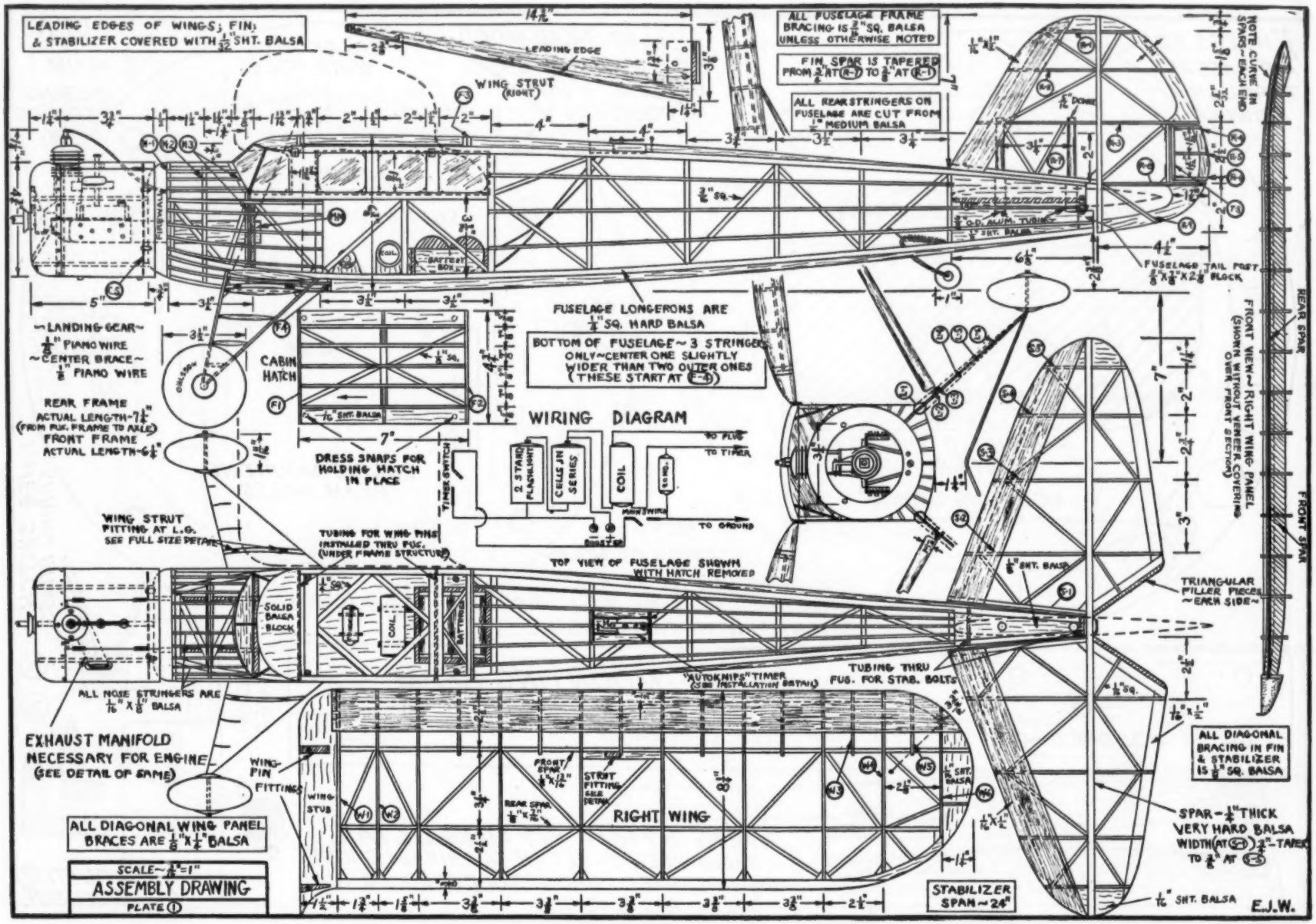
One last word before the actual beginning of the construction. In installing all metal fittings used in the ship, that is, where each is to be cemented to balsa, use only metallic cement such as is on the market, but which can be easily prepared by any model builder. The writer employs it in connection with all metal fittings in all of his gas jobs, and the great strength resulting through its use makes its preparation very worthwhile. It is generally believed that a metallic cement is the result of painstaking chemical research. Possibly some of that on the market is, but anyone mixing aluminum powder (not too fine) with a good grade of model cement to correct consistency has a metallic cement equal in strength to any fancy preparations offered in stores at a fraction of the cost. Of course, use the customary clear cement in all balsa-to-balsa joints.

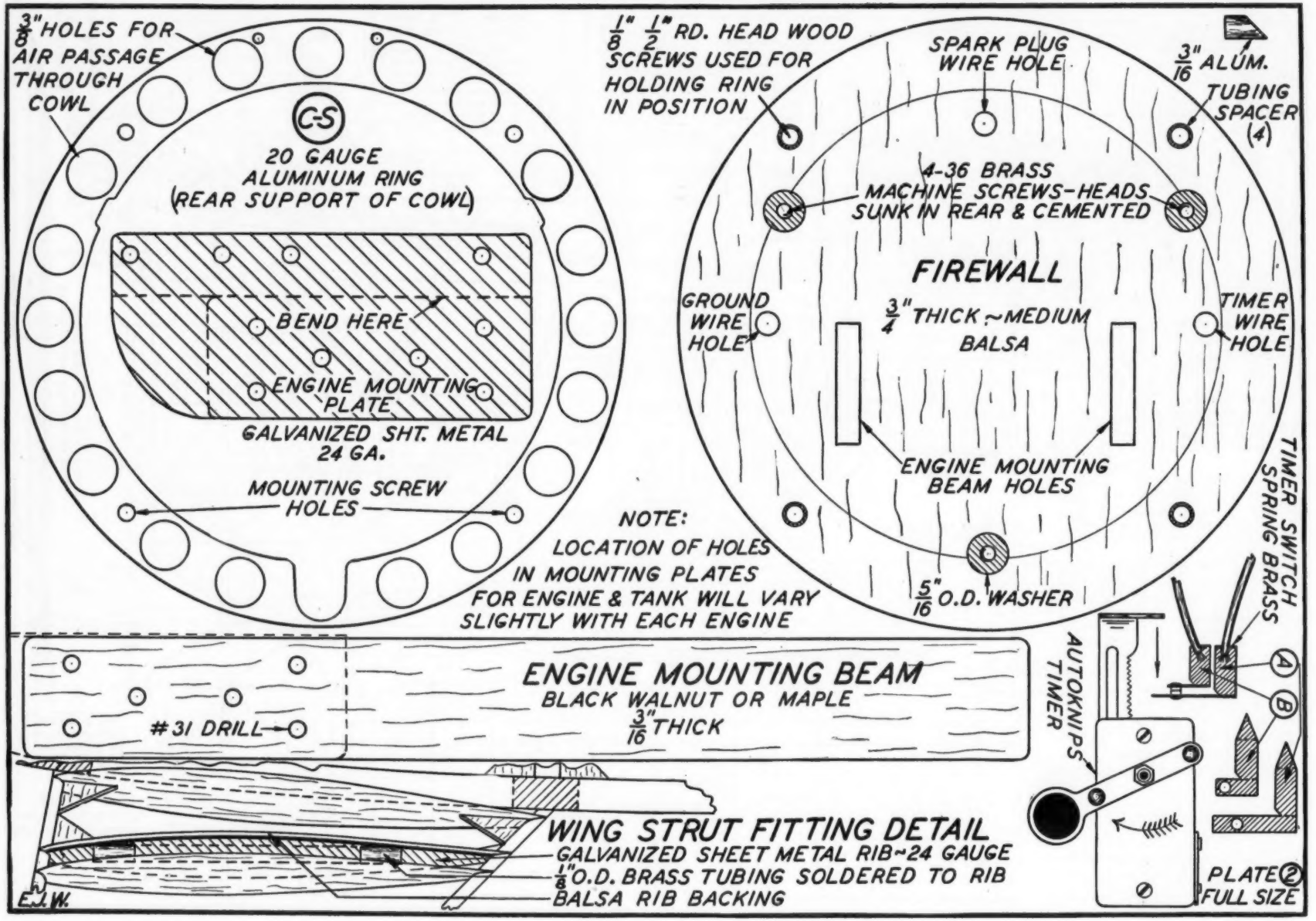
Fuselage and Landing Gear

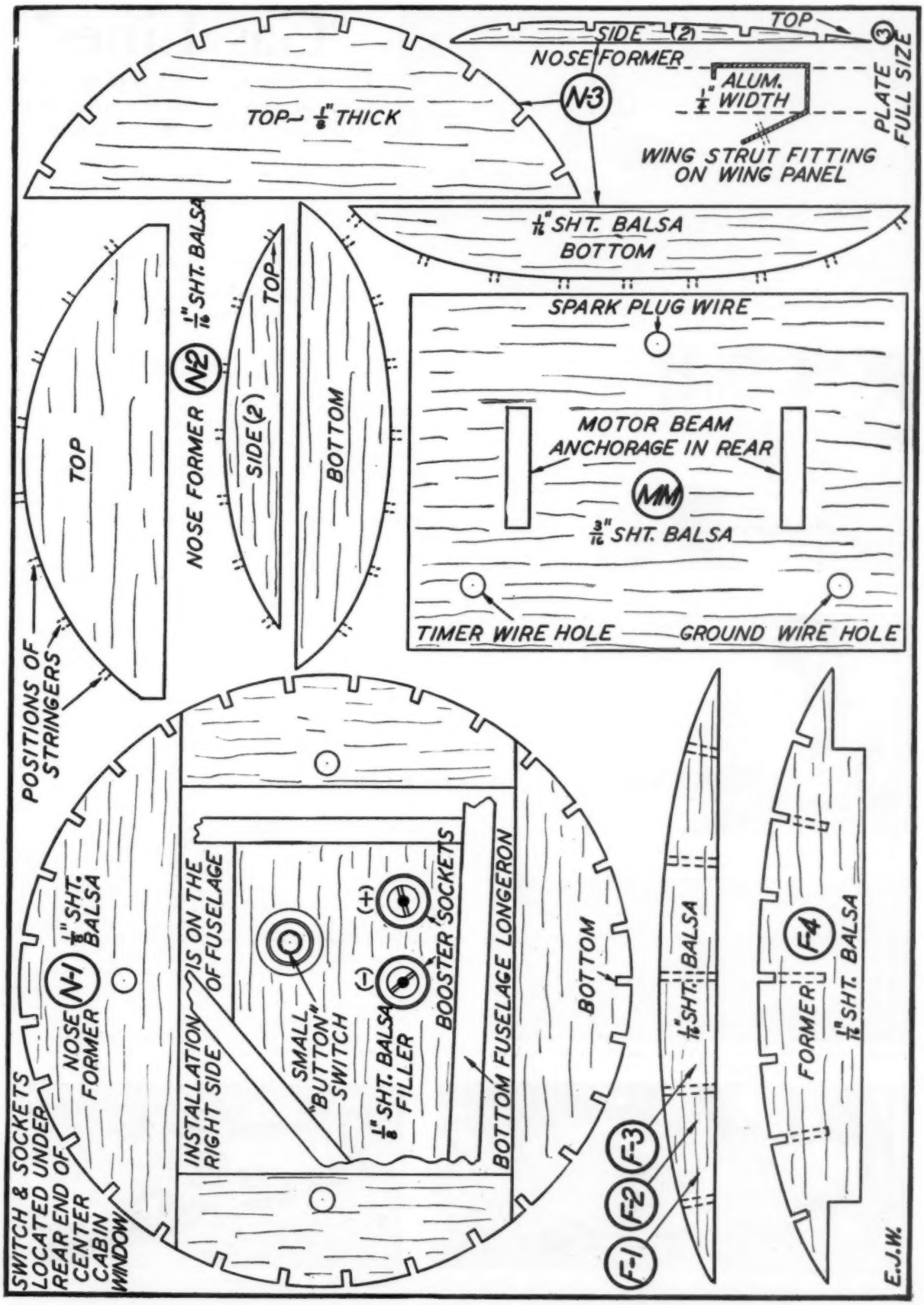
To begin construction of the fuselage, first lay out the fuselage frame (side and top views) on paper, full size, enlarging from the assembly drawing (Plate 1) through use of the scale. Be sure to retain the long gradual curve in the rear section of the fuselage frame. When the frame has been drawn to actual size, select some ¼" sq. hard balsa for the four longerons. All vertical and diagonal bracing is 3/16" sq. hard balsa. Be certain that stock for the vital members is of the best. Now build the side frames. Use 3/16" sheet balsa of widths specified in forming the cabin windows. Notice that the top longerons in the fuselage frame stop at the point where the front wing panel fittings are installed.

Auxiliary ⅛" sq. longerons of comparatively short length are built in to form the bottom line of the cabin windows and which extend to the front ends of the side frames. As the curve of the fuselage frames is somewhat abrupt on the bottom side at the nose, take care in forming this section. Now cut two ⅛" medium sheet balsa panels, to be installed in each frame at the rear end for ample protection and

(Continued on page 51)


LEADING EDGES OF WINGS, FIN & STABILIZER COVERED WITH 1/32" SHT. BALSA
ALL FUSELAGE FRAME BRACING IS 1/8" SQ. BALSA UNLESS OTHERWISE NOTED
FIN SPAR IS TAPERED FROM 3/8" AT F-7 TO 1/8" AT F-1
ALL REAR STRINGERS ON FUSELAGE ARE CUT FROM 1/16" MEDIUM BALSA
NOTE CURVE IN SPARS~EACH END
WING STRUT (RIGHT)
LEADING EDGE
FUSELAGE LONGERONS ARE 1/4" SQ. HARD BALSA
BOTTOM OF FUSELAGE~3 STRINGERS ONLY~CENTER ONE SLIGHTLY WIDER THAN TWO OUTER ONES (THESE START AT F-4)
~LANDING GEAR~ 1/8" PIANO WIRE ~CENTER BRACE~ 1/8" PIANO WIRE
CABIN HATCH
REAR FRAME ACTUAL LENGTH-7 1/4" (FROM FUS. FRAME TO AXLE) FRONT FRAME ACTUAL LENGTH-6 1/4"
DRESS SNAPS FOR HOLDING HATCH IN PLACE
WIRING DIAGRAM
TO PLUG
TO TIMER
TO GROUND
2 STAND. FLASHLIGHT
CELLS IN SERIES
COIL
TIMER SWITCH
WING STRUT FITTING AT L.G. SEE FULL SIZE DETAIL
TUBING FOR WING PINS INSTALLED THRU FUS. (UNDER FRAME STRUCTURE)
TOP VIEW OF FUSELAGE SHOWN WITH HATCH REMOVED
FUSELAGE TAIL POST 1/8"X1/8"X2 1/8" BLOCK
FRONT VIEW~RIGHT WING PANEL (SHOWN WITHOUT VENEER COVERING OVER FRONT SPECTRUM)
REAR SPAR
FRONT SPAR
TRIANGULAR FILLER PIECES ~EACH SIDE~
SOLID BALSA BLOCK
ALL NOSE STRINGERS ARE 1/16" X 1/8" BALSA
EXHAUST MANIFOLD NECESSARY FOR ENGINE (SEE DETAIL OF SAME)
"AUTOKNIPS" TIMER (SEE INSTALLATION DETAIL)
TUBING THRU FUS. FOR STAB. BOLTS
WING-PIN FITTING
WING STUB
FRONT SPAR 1/4"X1/2"
REAR SPAR 1/8"X1/2"
STRUT FITTING SEE DETAIL
RIGHT WING
ALL DIAGONAL WING PANEL BRACES ARE 1/16"X1/4" BALSA
ALL DIAGONAL BRACING IN FIN & STABILIZER IS 1/16" SQ. BALSA
SPAR~1/4" THICK VERY HARD BALSA WIDTH AT S-1 1/2"~TAPER TO 1/8" AT S-3
STABILIZER SPAN~24"
1/16" SHT. BALSA
SCALE~1/4"=1"
ASSEMBLY DRAWING
PLATE 1
E.J.W.


3/8" HOLES FOR AIR PASSAGE THROUGH COWL
C-S
20 GAUGE ALUMINUM RING (REAR SUPPORT OF COWL)
BEND HERE
ENGINE MOUNTING PLATE
GALVANIZED SHT. METAL 24 GA.
MOUNTING SCREW HOLES
1/8" 1/2" RD. HEAD WOOD SCREWS USED FOR HOLDING RING IN POSITION
SPARK PLUG WIRE HOLE
3/16" ALUM. TUBING SPACER (4)
4-36 BRASS MACHINE SCREWS-HEADS SUNK IN REAR & CEMENTED
FIREWALL
3/4" THICK ~ MEDIUM BALSA
GROUND WIRE HOLE
TIMER WIRE HOLE
ENGINE MOUNTING BEAM HOLES
5/16" O.D. WASHER
NOTE: LOCATION OF HOLES IN MOUNTING PLATES FOR ENGINE & TANK WILL VARY SLIGHTLY WITH EACH ENGINE
ENGINE MOUNTING BEAM
BLACK WALNUT OR MAPLE
3/16" THICK
#31 DRILL
WING STRUT FITTING DETAIL
GALVANIZED SHEET METAL RIB ~ 24 GAUGE
1/8" O.D. BRASS TUBING SOLDERED TO RIB
BALSA RIB BACKING
E.J.W.
AUTOKNIPS TIMER
TIMER SWITCH SPRING BRASS
A
B
PLATE 2 FULL SIZE

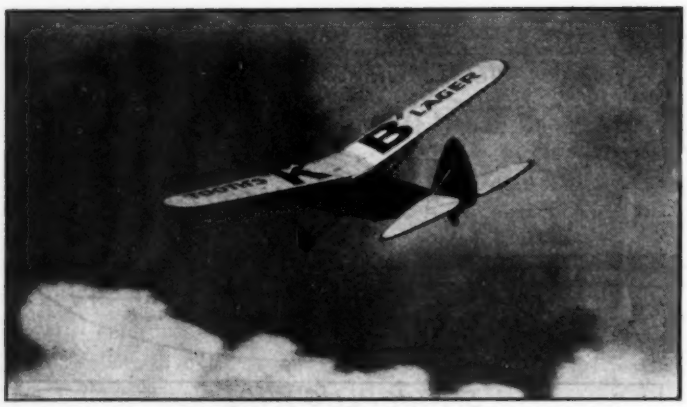

TOP
SIDE (2)
TOP
3
NOSE FORMER
N-3
ALUM. 1/16" WIDTH
PLATE FULL SIZE
TOP — 1/8" THICK
WING STRUT FITTING ON WING PANEL
1/16" SHT. BALSA BOTTOM
SPARK PLUG WIRE
MOTOR BEAM ANCHORAGE IN REAR
MM
3/16" SHT. BALSA
TIMER WIRE HOLE
GROUND WIRE HOLE
1/16" SHT. BALSA
N-2
NOSE FORMER
TOP
SIDE (2)
BOTTOM
POSITIONS OF STRINGERS
SWITCH & SOCKETS LOCATED UNDER REAR END OF CENTER CABIN WINDOW
1/16" SHT. BALSA
N-1
NOSE FORMER
INSTALLATION IS ON THE RIGHT SIDE OF FUSELAGE
SMALL "BUTTON" SWITCH
1/8" SHT. BALSA FILLER
(+)
(-)
BOOSTER SOCKETS
BOTTOM FUSELAGE LONGERON
BOTTOM
1/16" SHT. BALSA
F-1
F-2
F-3
F-4
FORMER
1/16" SHT. BALSA
E.J.W.

"Gas Lines"

Latest News of Members of the International Gas Model Airplane Assn. From All Parts of the World

The I.G.M.A.A. Pin

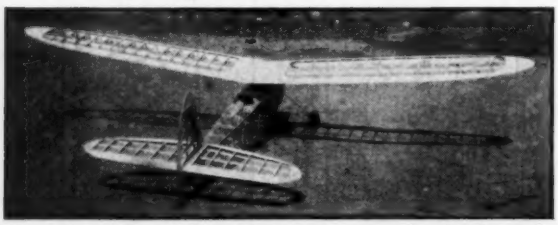
Don't Miss the Comments on Gas Models at the End of This Article



Picture No. 1. Ken Moore's Australian record holder in full flight

Picture No. 4. J. Marsden, winner of the Southern Cal. Gas Model Assn. Contest

Picture No. 5. Peggy Snyder and her Baby Cyclone-powered Scout



Picture No. 10. William Ying's new gas model that he took to the "Nationals." It has a 10 ft. spread

GREAT excitement has been caused among thousands of gas model fans throughout the country by the attack of subversive forces on gas model activities. Many letters have been received by the I.G.M.A.A. wondering what was going to be done about this. The editorial which appeared in the August issue answered these questions in many cases.

However, one of the important weapons which all gas model fans may use is caution. Those who are against gas models are waiting for a chance to say, "I told you so," and to use any unfortunate incident occurring from gas model flights to make good their accusations.

Our first suggestion, therefore, is that every gas model flier use the greatest care when flying his model so as to avoid any damage to property or persons. The enemies of gas models have endeavored to exaggerate this danger in order to make it appear that it is great enough to ban the use of gas models. To date records show that such dangers are insignificant, inasmuch as no serious damage to persons or property has resulted. Let us keep the record of gas model plane operation as clean as this in the future.

All I.G.M.A.A. unit leaders are requested to set up flying rules, the character of which are in keeping with the locality in which they reside and operate. All infringements of such rules should be reported to headquarters, as well as any difficulties resulting from such infringements. Unless a thorough understanding of such situations is received by the directors of the I.G.M.A.A., no intelligent and effective action can be taken.

Another way to combat any form of repression of gas models is to sell the idea of gas models to every boy and older person with whom you come in contact. Every members of the Association is urged to do this to the fullest extent. In other words "spread the gospel" of the value and safety of gas models. Today gas models are educating young and older men in the science of aviation to a greater extent than any other hobby or educational medium. In this lies its great strength and we doubt if it is possible for anyone to damage the cause when it stands so firmly on a fundamental necessity.

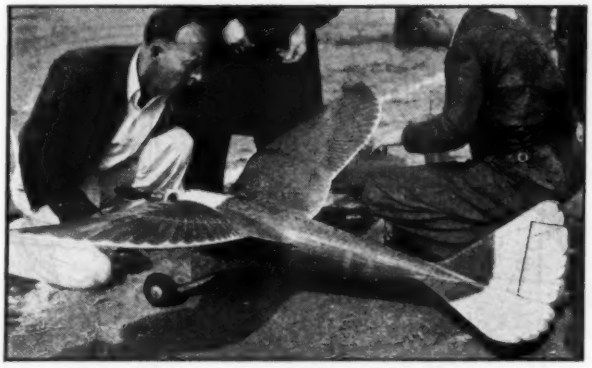
Several remarks and comments on the situation appear in the last part of "Gas Lines." We suggest that you read them. If you have any personal comment or word of progress that you have made in the fight against this repression, we hope you will pass on a word to us so that it may be printed in these pages for the benefit of all members of the I.G.M.A.A.

One of the "hot-beds" of gas models appears to be Australia. This sport has taken that country by storm. Mr. Ivor Freshman of 67 Liverpool Street, Sydney, Australia, has been kind enough to send us several pictures of activities in the neighborhood of Sydney. Picture No. 1 shows the ship of Ken Moore in full flight. This ship holds the Australian record of 39 minutes. Unfortunately on this flight the plane dropped one wing which caused it to spin in and demolish itself.

Picture No. 2 shows the line-up of some

Picture No. 3. An exhibit of gas models at Marsh & Co., Indianapolis, Ind. Note the Buck Rogers Special

Picture No. 2. Some leading Australian gas model builders who have assembled for a day of flying



Picture No. 6. The most remarkable model at the Cal. contest, an exact replica of a hawk built by Miss Hobart

Picture No. 7. Harold Ball and his plane that won the appearance event by popular acclaim. (Cal.)

of the leading gas model builders in Australia and their ships. Left to right they are: Annesley, Finneran, Donald, Moore, Nesbitt, Allcroft, Grant, Anderson, Campbell, Corfet, Soberlet. This picture was taken after a day of flying. Soberlet made the best flight of the day with 9 minutes, 5 seconds.

Several units have been formed in Australia. The first one was Unit No. 13, under Mr. Freshman's direction. Mr. Freshman writes that several members have been reluctant to join this particular unit, desiring to form a unit of their own. As most members know, no one unit is given authority by the Association to control any particular district. The sole factor or quality which must be present in order to cause a person to join a unit is the quality of the unit itself. In other words, units must be on a competitive basis. This will stimulate each particular unit to make itself as fine as possible in order to attract other members. To give one unit authority over any particular district and to make it the sole unit in that district would eventually undermine the organization and cause it to be political-minded. The I.G.M.A.A. must stand on quality and on nothing else.

Jim Cahill of Indianapolis, Indiana, sends us picture No. 3. It shows an exhibit of gas model planes recently held in this city by Marsh & Company. The biplane is by Boehle and Stofer, Cahill tells us, but we have had difficulty in picking it out in the picture. The low-wing is by Millar and the Buck Rogers special is by Cahill, if we have read his letter correctly.

William B. Ryan of Grand Central Air Terminal, Glendale, Calif., sends us detailed news of the contest recently held by the Gas Model Airplane Association of Southern California. He sends us several pictures. Picture No. 4 shows the winner, J. Marsden of Pacific Beach, Calif., and his J.M. Special which was powered with a Brown Jr. motor. It has a span of 75 inches. The little ship hooked in a thermal and stayed in the air for 15 minutes, 24 seconds, after a 35 second motor run.

Picture No. 5 shows Peggy Snyder's Baby Cyclone-powered Scout. This was one of the few ships entered by a woman. Unfortunately someone stepped on the stabilizer before she was able to fly it and it was put out of commission.

The most remarkable gas model ever produced, in our opinion, has been built by Evelyn Hobart. We can do no less than classify Miss Hobart as a genius. She has combined the unusual qualities of artist and engineer in producing this little ship. It is shown in picture No. 6 and is an exact replica of a hawk. The wings, tail, head and body have been given the shape of this type of bird. In the picture the very realistic beak and eyes are blanketed by the wing. However, we assure you that the whole nose of this ship resembles exactly the head of a hawk. Another picture will appear next month showing this in detail.

Picture No. 7 shows Harold Ball of Van Nuys, Calif., winner of the appearance contest. All the ships entered in this event had to be flown with full equipment. His ship included many details most efficiently built into the construction.

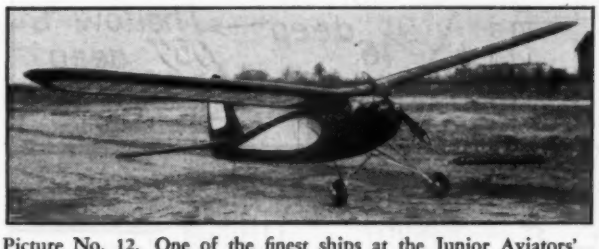
Picture No. 8 shows ten of the best planes lined up for the appearance contest. They

(Continued on page 46)

Picture No. 9. Barney Snyder broadcasting details of the events at the Cal. contest

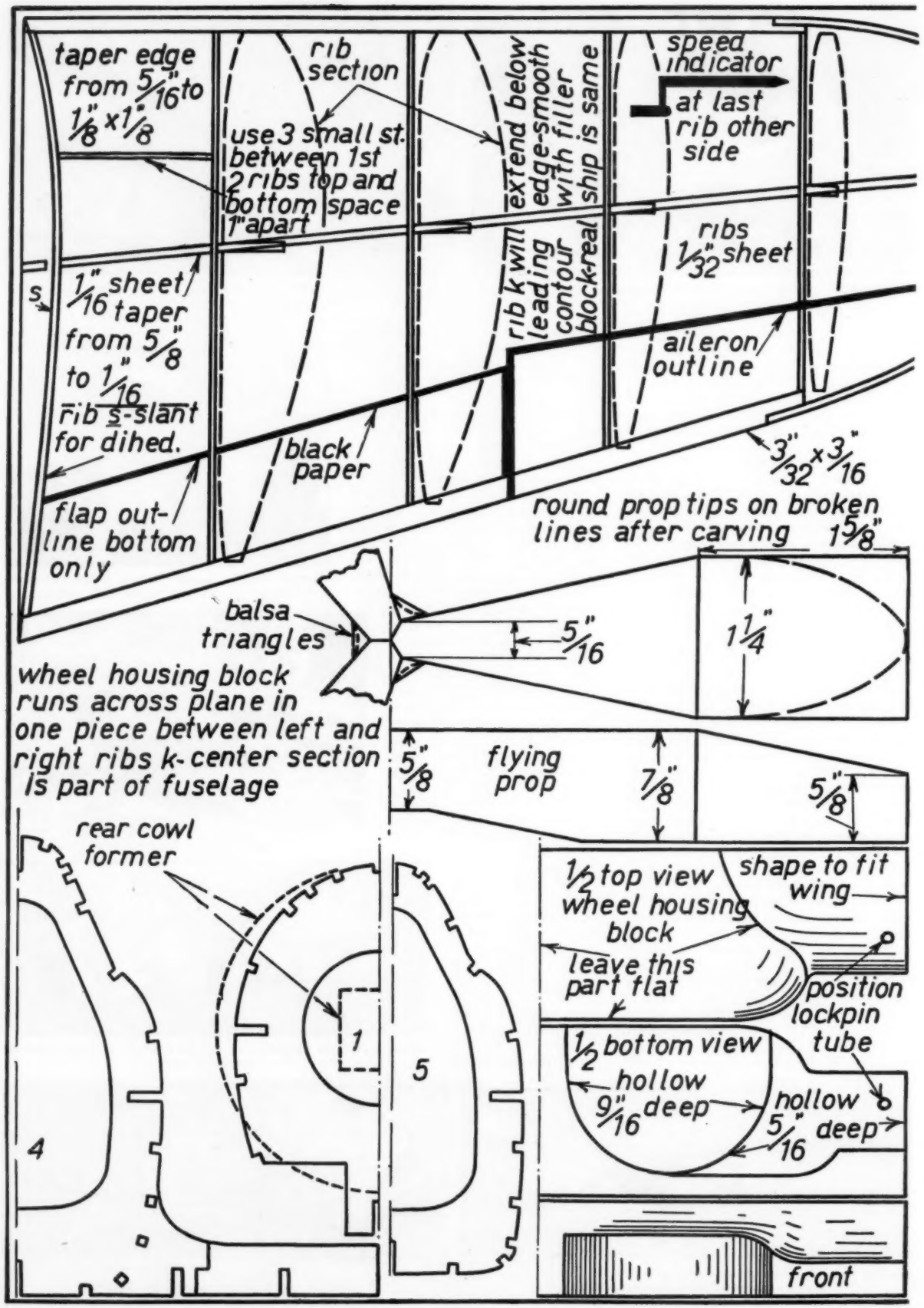
Picture No. 8. Ten planes selected as eligible for the appearance contest. (Cal.)

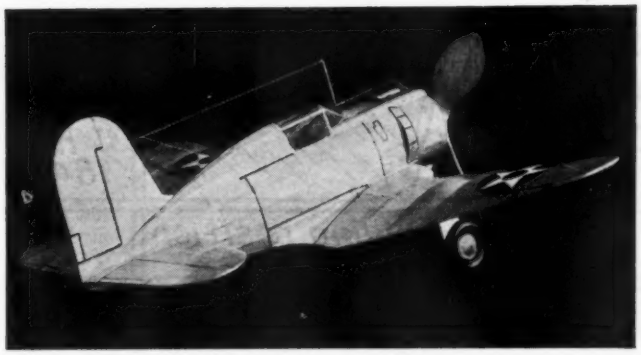
Picture No. 13. A group of gas model fans in Iowa, after a day of flying



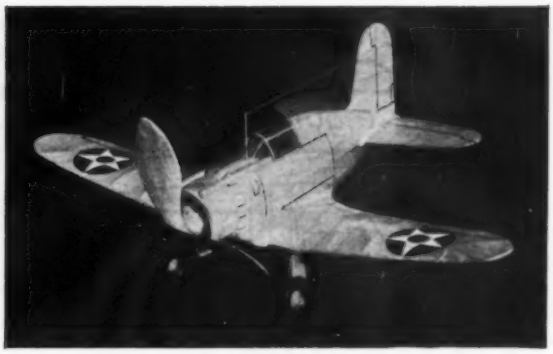
Picture No. 12. One of the finest ships at the Junior Aviators' contest recently held in Toledo, Ohio

Picture No. 11. Michael Roll with his plane that won a contest held by the Scripps-Howard Jr. Aviators


taper edge from 5/16 to 1/8" x 1/8"
rib section
use 3 small st. between 1st 2 ribs top and bottom space 1" apart
extend below edge-smooth with filler ship is same
speed indicator at last rib other side
ribs 1/32" sheet
rib k will leading contour block-real
1/16" sheet taper from 5/8" to 1/16" rib s-slant for dihed.
s
aileron outline
black paper
3/32" x 3/16"
flap out-line bottom only
round prop tips on broken lines after carving
1 5/8"
balsa triangles
5/16"
1 1/4"
wheel housing block runs across plane in one piece between left and right ribs k-center section is part of fuselage
5/8"
flying prop
7/8"
5/8"
rear cowl former
1
5
4
1/2 top view wheel housing block
shape to fit wing
leave this part flat
position lockpin tube
1/2 bottom view
hollow 9/16" deep
hollow 5/16" deep
front



Cleverly designed to give a realistic appearance



A large prop insures high performance

A Vought Fighter That Flies

By WILLIAM WINTER

Complete Data from Which You Can Build an Excellent Performing Flying Scale Model of the U.S. Navy V-143 Fighter

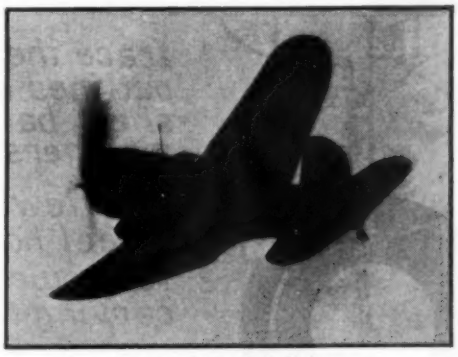
THE new Vought single-place fighter is of all-metal construction and is characterized by its high performance.

Its design includes retractable landing gear, wing flaps, controlled engine cooling flaps and a Hamilton Standard controllable pitch propeller. Either the Pratt & Whitney Wasp Junior or the Twin Wasp Junior power plants may be utilized.

With the Wasp Junior of only 525 hp. the high speed is 250 m.p.h., cruising speed 220 m.p.h., service ceiling 28,000 ft., landing speed 60 m.p.h. and the range 770-1070 miles. With the Twin Wasp of 700 hp. the performance should show a material difference.

Features of the armament and equipment are the two 30 calibre machine-guns and the racks for 300 lbs. in bombs.

The model is accurately scaled and includes in its construction a workable folding landing gear. The model will fly with the wheels retracted, hand-launched over grass of course, a well as in the conventional manner. The little ship is a picture in flight or on the shelf. At time of drawing ship was experimental so paint all silver or blue fuselage and orange wings. Use star insignia.



The model in full flight

Fuselage

Trace the side, top and bottom outlines of the fuselage on 1/16" sheet balsa and cut out the master stringers, allowing about a ¼" width tapering toward the rear as seen on the plans. On them mark the positions of the bulkheads.

Cut the bulkheads from 1/16" sheet balsa in accordance with the patterns given. Cut only the large notches for the master stringers marking the smaller ones for a later operation. Cement bulkheads No. 1 to No. 4 on the two side master stringers. When the cement has set, add the remaining formers. Note that No. 8 is two ply cross-grained. The rear hook is bent to shape from .028 wire and fastened in this bulkhead. Add the top and bottom master stringers.

The center section ribs J and K are cut to shape from 1/16" sheet and cemented in place on the bulkhead extensions. Follow the details given in attaching the tubing to rib K. Reinforce and bind with thread as shown.

The wheel housing block which extends across the fuselage will snugly fit between the left and right ribs K. First trim this block down to its required outside dimensions before attempting any shaping. This prepared block is now cut to the top profile shown on the cutaway top view and in the detail. The portion of the block that fits within the body is left flat. The outer portion that extends from the outer rib J to the rib K is shaped to fit the wing as required. The wheel and strut cut-outs are made on the bottom to a depth that will accommodate those parts when in the "up" position. Dimensions for the cut-outs are obtained from the block detail.

Cement the auxiliary 1/16" sq. stringers in place cutting the notches already marked as the work progresses.

Shape the machine-gun covered troughs from 5/16" x ¼" soft balsa and fasten them in position. They are made in two portions as seen on the plans the front sections being attached after the cowl is in place.

The front curved edge of the cockpit enclosure is bent to shape from 1/32" sheet. The headrest is 3/16" sheet.

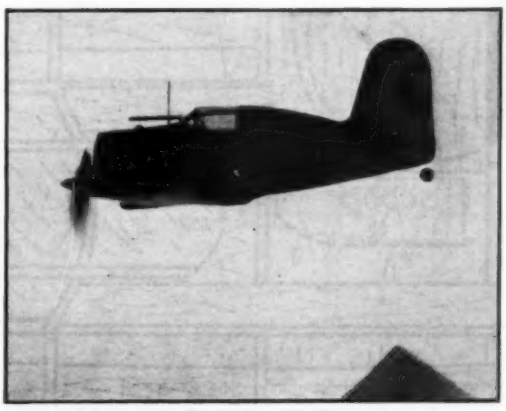
Complete the center section by adding the trailing edge and the 1/16" sheet fillet former seen on the top view.

Shape the tail block from soft balsa and match it to the rear bulkhead. Do not locate the filler sheet at either side until the stabilizer halves are in position. To this block fasten the tail wheel axle with the wheel already in place. Cement the completed block to the fuselage.

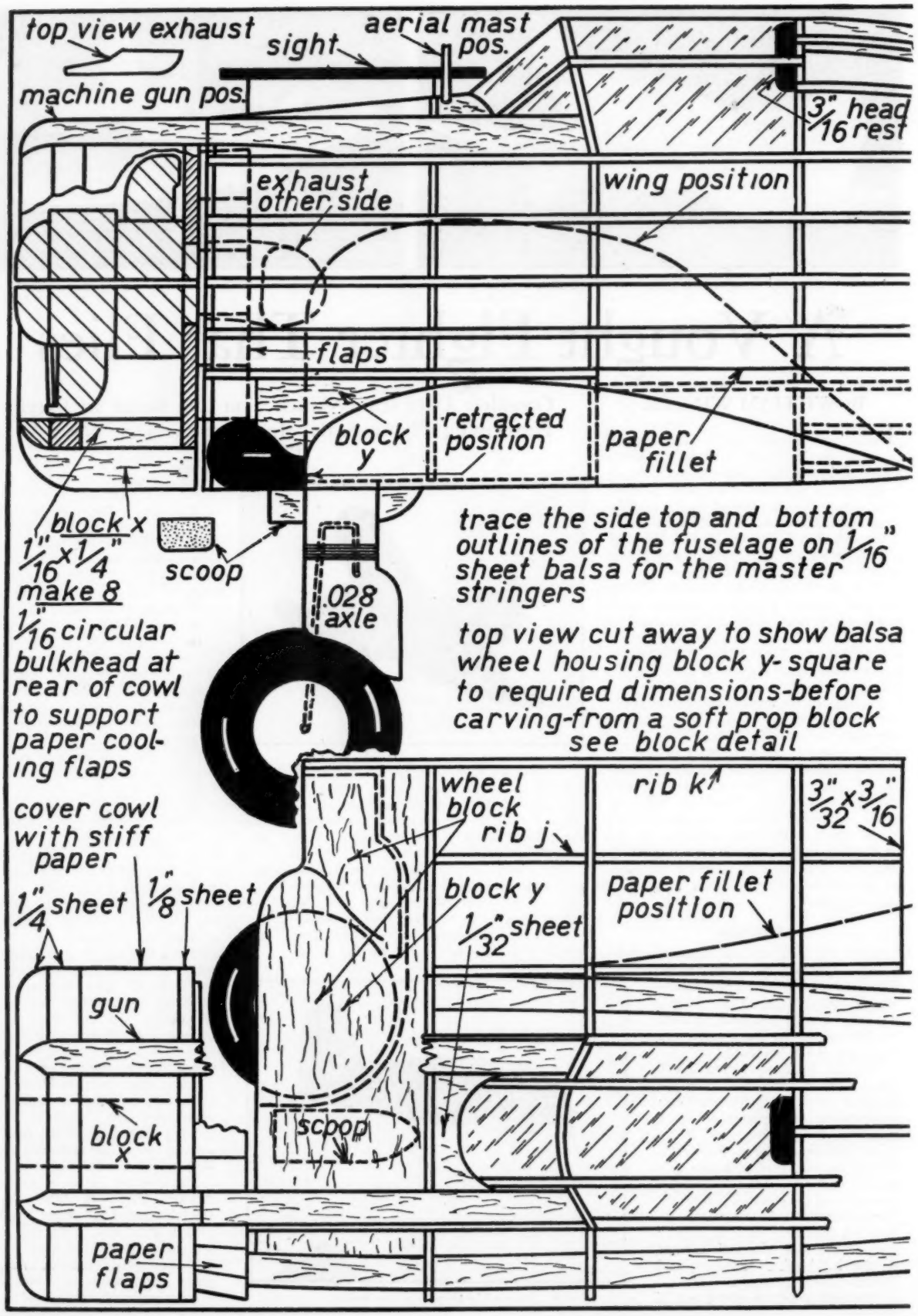
Carve the two stabilizer fillet blocks, one left and one right hand from 3/16" soft sheet balsa. After sanding glue them to the fuselage sides at the proper place and angle. Be particular on this point.

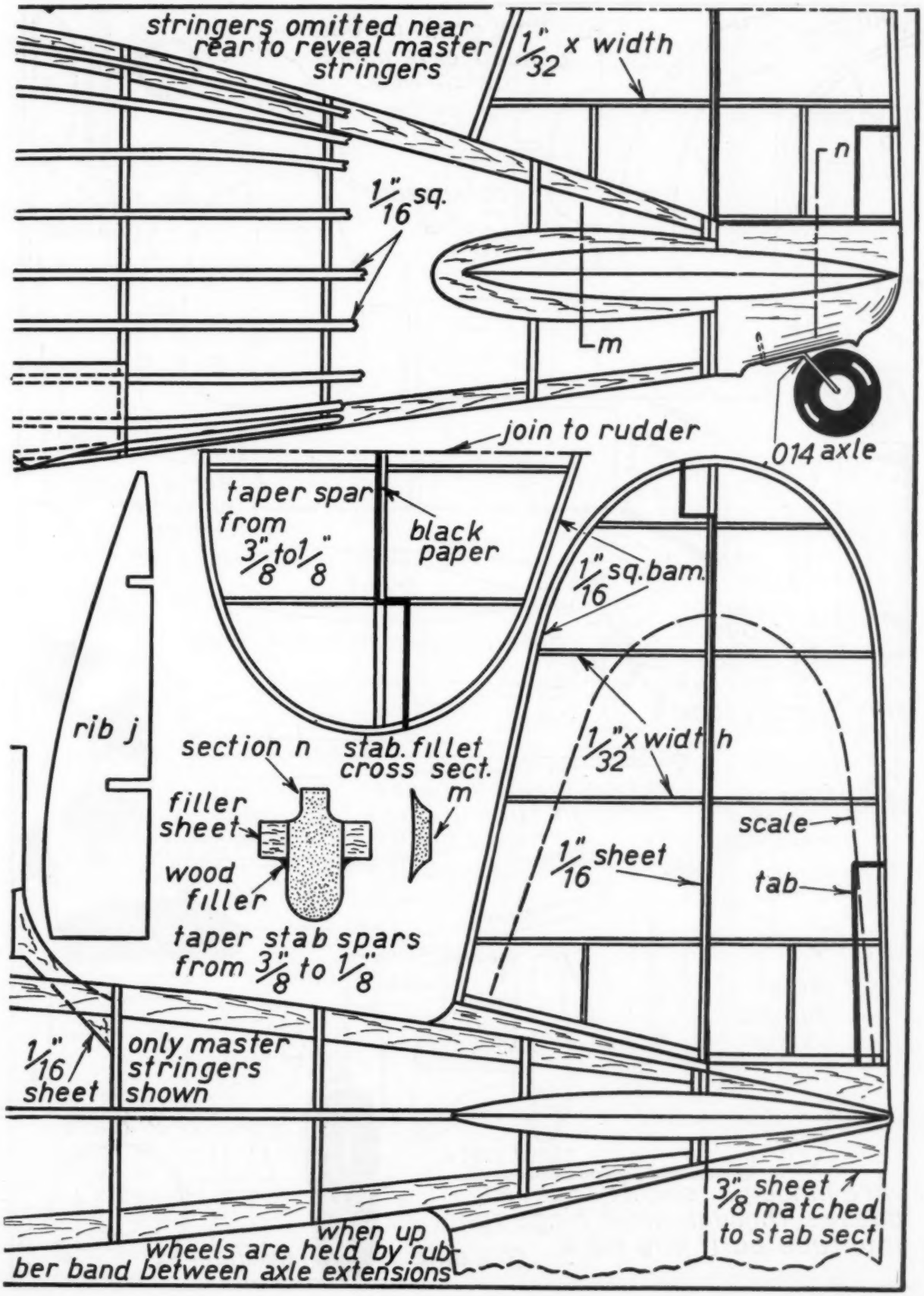
The cowling is to be made at this time. The front plate is shaped from laminated ¼" discs. The rear piece is a ⅛" disc. These two parts are spaced by 8 1/16" x ¼" strips. The open space is covered by a stiff paper band wrapped around the

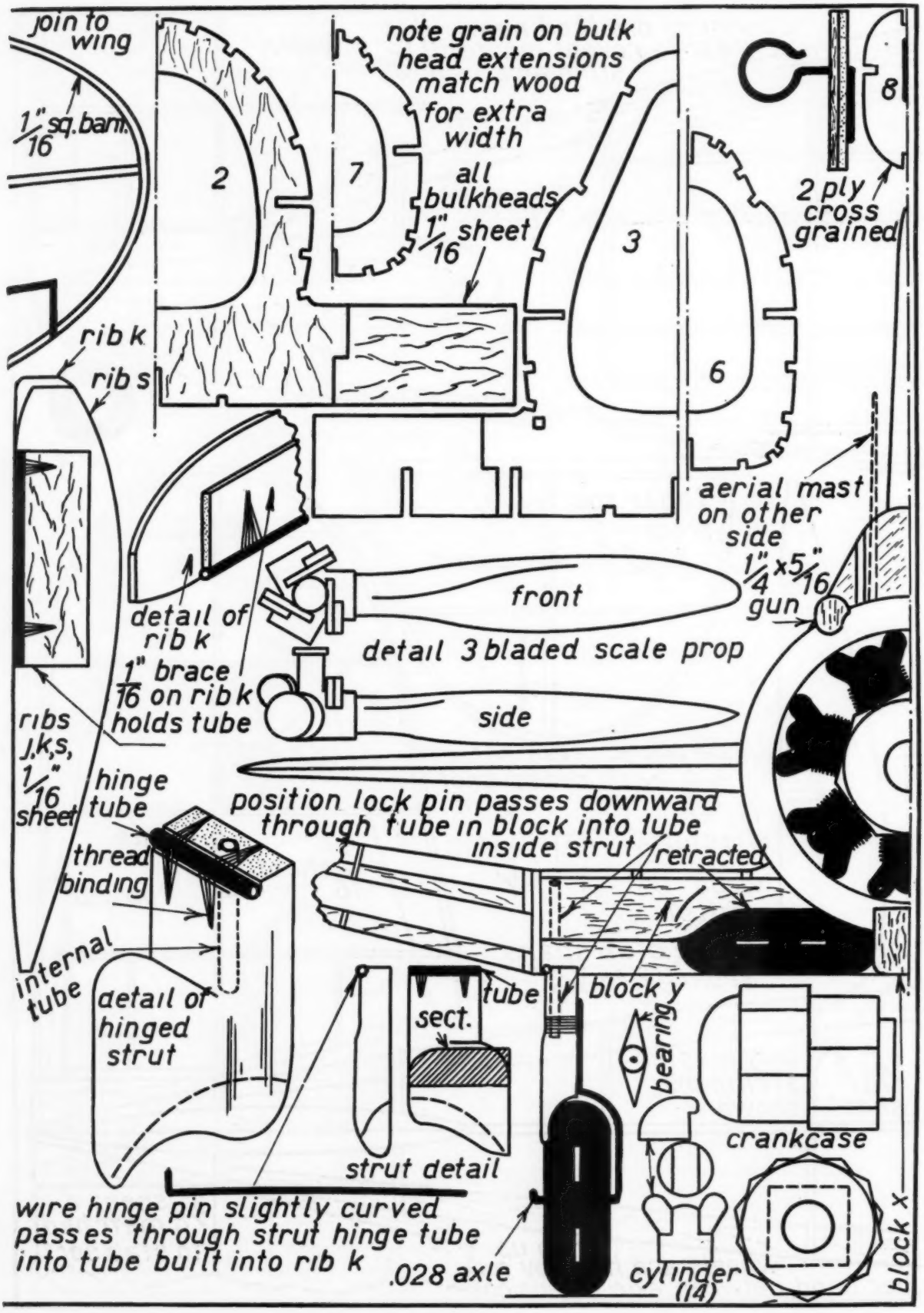
(Continued on page 44)



Not a big ship, just the model


top view exhaust
sight
aerial mast pos.
machine gun pos.
3" x 3/16 head rest
exhaust other side
wing position
flaps
block y
retracted position
paper fillet
block x 1/16" x 1/4"
make 8
1/16" circular bulkhead at rear of cowl to support paper cooling flaps
scoop
.028 axle
trace the side top and bottom outlines of the fuselage on 1/16" sheet balsa for the master stringers
top view cut away to show balsa wheel housing block y- square to required dimensions-before carving-from a soft prop block see block detail
wheel block
rib j
rib k
3" x 3/16"
32
block y
1/32" sheet
paper fillet position
cover cowl with stiff paper
1/4" sheet
1/8" sheet
gun
block x
scoop
paper flaps


stringers omitted near rear to reveal master stringers
1/32 x width
n
1/16 sq.
m
014 axle
join to rudder
taper spar from 3/8 to 1/8
black paper
1/16 sq. bam.
rib j
section n
stab. fillet cross sect.
m
filler sheet
wood filler
1/32 x width h
scale
1/16 sheet
tab
taper stab spars from 3/8 to 1/8
1/16 sheet
only master stringers shown
3/8 sheet matched to stab sect
when up wheels are held by rubber band between axle extensions


join to wing
1" sq. bam.
1/16
2
7
note grain on bulk head extensions match wood for extra width
all bulkheads 1/16" sheet
3
8
2 ply cross grained
6
rib k
rib s
aerial mast on other side
1/4" x 5/16"
gun
front
detail of rib k
1" brace 1/16 on rib k holds tube
detail 3 bladed scale prop
side
ribs J,K,S, 1/16" sheet
hinge tube
position lock pin passes downward through tube in block into tube inside strut
retracted
thread binding
internal tube
detail of hinged strut
tube
sect.
block y
bearing
crankcase
strut detail
wire hinge pin slightly curved passes through strut hinge tube into tube built into rib k
.028 axle
cylinder (14)
block x

The latest Army attack plane, the Northrop A-17 of 750 hp. (Williams from Mitchell)

Frontiers of Aviation

What Our Aircraft Industries Need and Highlights of Planes They Are Producing—Building the Timm Transport

By ROBERT C. MORRISON

The Italian trainer Caproni CA-100 with 85 hp. Gypsy. (Tenety)

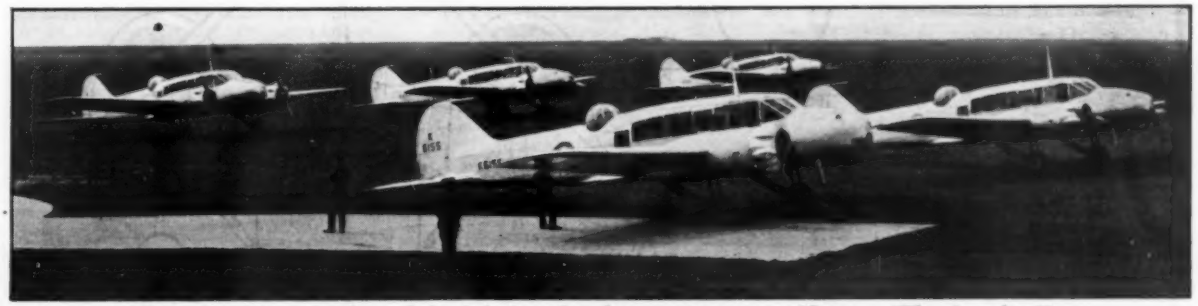
They tell us that this is the Russian lightplane K.A.I.-3 but it looks like a fighter to experienced eyes

The plane in which three Russians made a non-stop flight from Moscow to Vancouver, Canada, crossing the North Pole

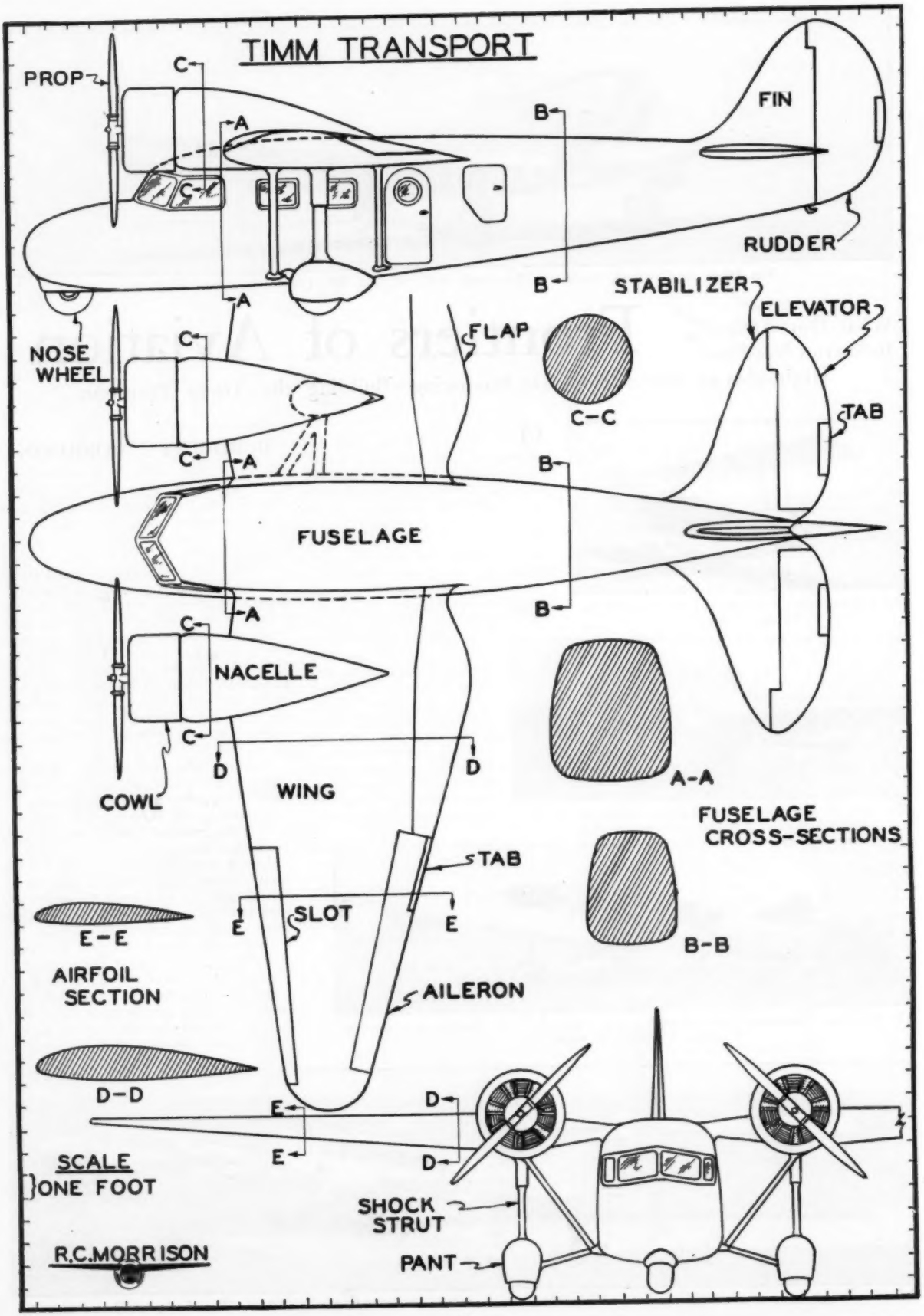
ONE very good thing about the aviation industry these days is that its foundation is sound with good financial backing. The rise of aviation in 1929 was too sudden for it to be genuine, and though prosperity did not last the industry never reached the low ebb with which its competitors in transportation were confronted. Our present prosperity which may go on indefinitely is contributed mostly by our learned aeronautical engineers and the presidents of our huge airplane companies who have proved themselves experts in matters of finance. Surprising as it may seem and which is seldom the case in any other form of business, the presidents of our companies are well versed in aeronautical engineering. Not only do they know how to take care of the companies' money interests but they know how a plane should be built and to whom to sell it.

That is why aviation can "stand on its own feet" and why progress will be rapid though steady—and that is also why the youth of today who makes aviation his occupation has splendid opportunities ahead of him if he applies himself in the right way. What this has to do with new types of aircraft is obvious. It will be the youth of today who will build tomorrow's airplanes, and it is the financiers of today who will make it possible to build tomorrow's airplanes.

However this does not mean that any youth may blossom out into the aviation world without any preparation or sincerity. Since this paper is devoted to the air-minded boy and girl it might be well here to explain briefly the type of work to which one may apply himself solely in the manufacturing end of aviation and how he may prepare for such work. Of course one should always endeavor to obtain a college education if the opportunity prevails and if such is not possible the next best thing is training in an aviation trade school of which there are many throughout the country of very fine standing. In some cases it might be well to enter a trade school after leaving college to get the practical experience as well as the somewhat involved



British Avro Anson bombers of the 40th Aero Squadron at maneuvers. (Courtesy "The Aeroplane")


TIMM TRANSPORT
PROP
C
A
B
FIN
RUDDER
STABILIZER
ELEVATOR
TAB
NOSE WHEEL
FLAP
C-C
FUSELAGE
NACELLE
COWL
D
WING
A-A
FUSELAGE CROSS-SECTIONS
TAB
SLOT
E
E-E
AIRFOIL SECTION
B-B
AILERON
D-D
SCALE
ONE FOOT
SHOCK STRUT
PANT
R.C.MORRISON

The 200 m.p.h. trans-Atlantic plane, DeHavilland Albatross, spreads its wings. (Globe Photo)

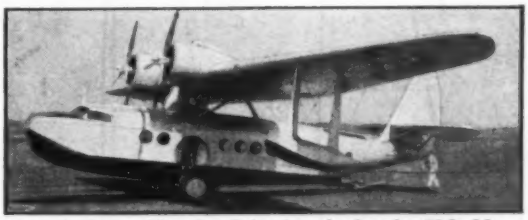
theoretical knowledge obtained at college. In almost the complete majority of colleges, aeronautical engineering is not taken up until the last part of the junior year and all of the senior year. Courses previously taken lend themselves to aeronautics indirectly and only occasionally and most often you will not see their connection until you become active in the industry. However the courses given at aviation trade schools deal only with aeronautics and are separated into two distinct groups, engineering and mechanics. The engineer is of course the one that designs the airplane and the mechanic is the one who builds them. After leaving school it is best to specialize in one of three branches of aeronautical engineering — drafting, aerodynamics or stress analyzing—or in the many branches of mechanics which will eventually dwindle down to sheet metal and foundry work in time to come.

The aircraft manufacturing companies are greatly in need of men with a good education in aeronautics and for this reason aviation schools now have large enrollments. A new large school is now being constructed in Glendale, California, for aeronautical engineers and mechanics at a cost of $200,000. Four good size buildings of very modernistic design are being constructed and will soon be ready for occupancy. The buildings have a very fine appearance, and the school should be a boon to aviation. John K. Northrop, president of the Northrop Corporation, and Robert Gross, president of the Lockheed Aircraft Corporation, are two of many of the prominent members on the advisory committee.

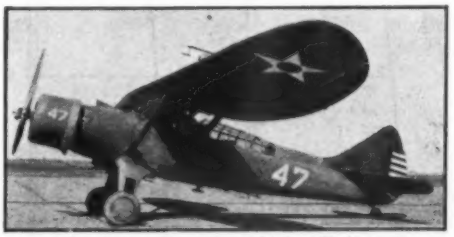
One must not retain the idea that because of the overwhelming prosperity of aviation that anyone entering the industry will get rich quickly. As a rule the standard of pay among the workers is very low. The reason for that is that it takes so many men to build an airplane. If the men were to get high wages the costs of aircraft would be extraordinarily high. However, with the adaptation of more machinery and the demand for more aircraft, this situation may change decidedly. The machinery will not replace the men, but instead produticon will increase. As in every line of business the only way to succeed in the aviation industry is by plenty of hard dilligent work.

One of the latest creations of Mr. O. W. Timm is the fine two-engined transport which is about ready for its first test flight as this is read. Built in the shops of the Timm Aircraft Corporation at Glendale, California, this new ship has many novel features. Not only is it the first modern bi-motored airplane to have a tricycle landing gear (the front wheel being operated hydraulically from the rubber pedals) but it also has Handley-Page slots and flaps. The three-wheel landing gear makes it possible for the fuselage to be horizontal and close to the ground when the ship is taxied up to the passenger ramp and allows for easy entrance. The pilot will also have excellent vision when taxiing, taking off, and landing. It will be almost impossible to overturn when landing in the Timm with such a landing gear; also the possibility of ground-looping is eliminated. Take-off and landing runs will be shorter.

General mailplane used by the Wright Eng. Co. to test high hp. engines. (Williams from Kuster)



One of eleven Sikorsky S-43s bought by the U.S. Navy. (Morrison from Burke)

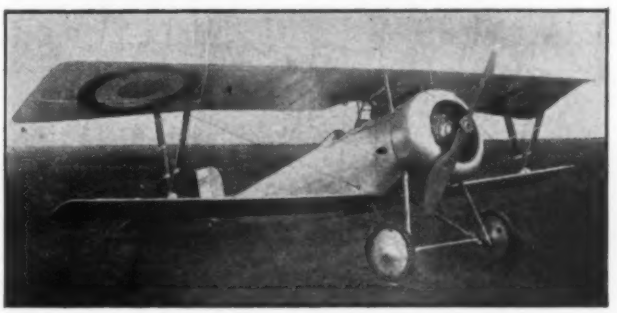


The latest Douglas 046-A. (Boisseau)

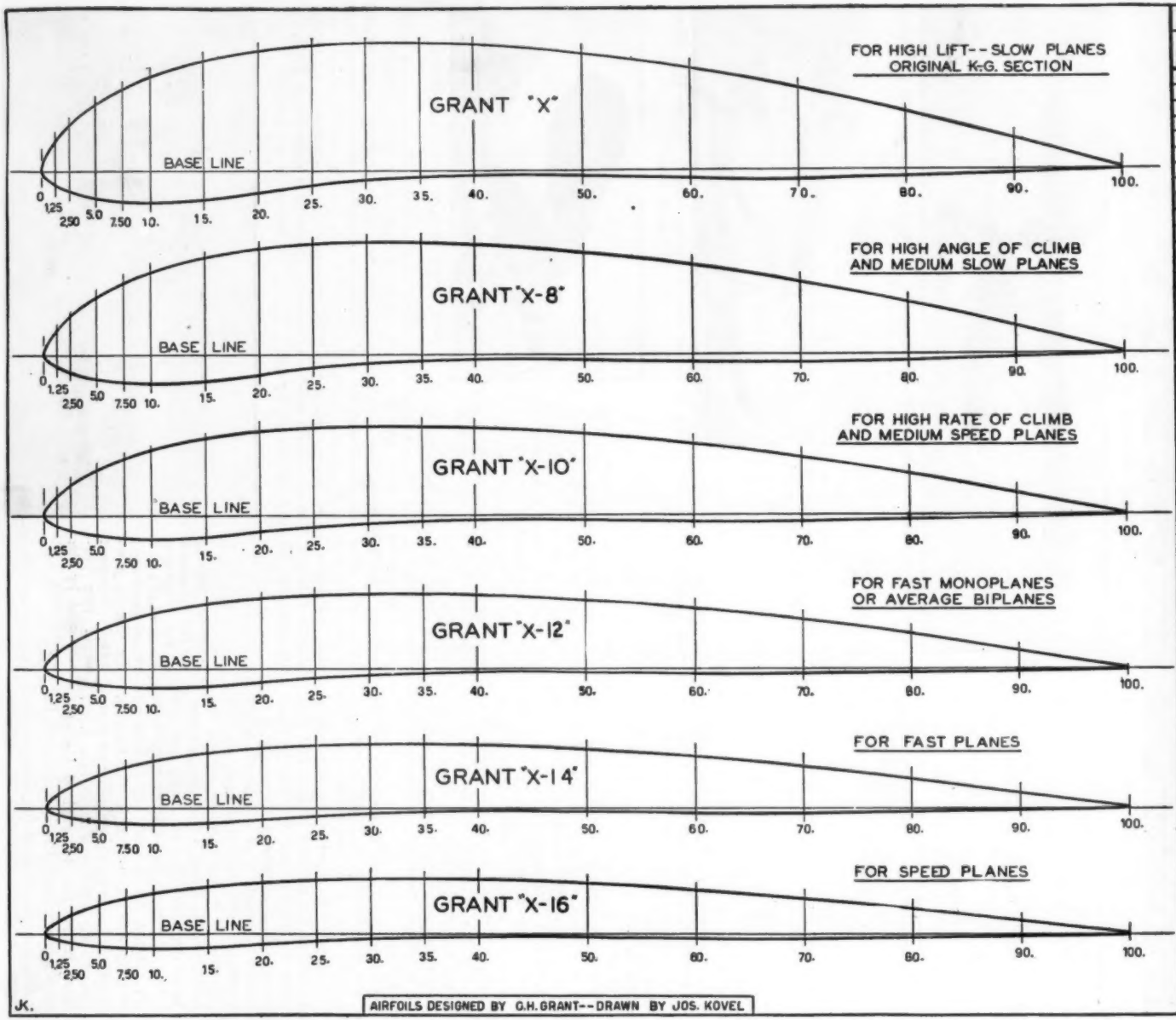
The latest Timm is basically a six-place airplane with 180 pounds of baggage, 200 pounds of mail, and is fully equipped with instruments, two-way radio, flares, etc. With the elimination of the lavatory and mail compartments, a maximum seating capacity of ten passengers may be obtained. The windshield windows are movable and may be cleaned by the pilot when in flight. The high wing design affords the passengers good visibility.

The root sections of the wing extend from the fuselage to the outside edge of the engine nacelles and are constructed of steel tube spars heat-treated to 150,000 pounds. Covering is sheet metal. From the

(Continued on page 52)



Here is one of the famous planes of the "Frontiers of Aviation" twenty years ago; the Gnome powered Nieuport single seat pursuit used by the French



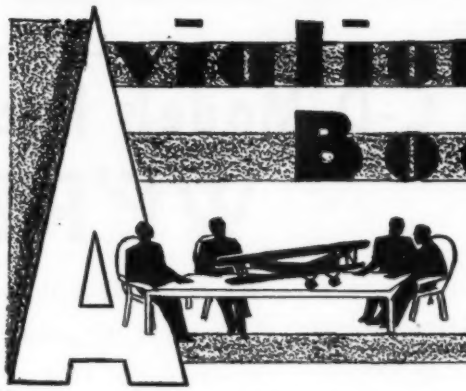
AIRFOILS DESIGNED BY G.H. GRANT--DRAWN BY JOS. KOVEL

CURVE ORDINATES

% STA.	GRANT "X" % U.C.	GRANT "X" % L.C.	GRANT "X-8" % U.C.	GRANT "X-8" % L.C.
0	0	0	0	0
1.25	2.73	- 1.33	2.40	- 1.20
2.50	4.27	- 1.87	3.73	- 1.67
5.0	6.20	- 2.67	5.40	- 2.33
7.50	7.67	- 3.0	6.73	- 2.67
10.	8.80	- 3.07	7.73	- 2.73
15.	10.33	- 2.93	9.07	- 2.53
20.	11.20	- 2.20	9.80	- 1.93
25.	11.73	- 1.53	10.27	- 1.33
30.	12.0	- 1.0	10.53	- .87
35.	12.0	- .73	10.53	- .67
40.	11.80	- .60	10.33	- .53
50.	10.80	- .67	9.53	- .60
60.	9.47	- .93	8.27	- .80
70.	7.60	- 1.07	6.60	- .93
80.	5.33	- .80	4.67	- .73
90.	2.80	- .47	2.47	- .40
100.	.07	- .07	.05	- .05

% STA.	GRANT "X-10" % U.C.	GRANT "X-10" % L.C.	GRANT "X-12" % U.C.	GRANT "X-12" % L.C.
0	0	0	0	0
1.25	1.93	- .93	1.60	- .80
2.50	3.0	- 1.33	2.47	- 1.07
5.0	4.33	- 1.87	3.60	- 1.53
7.50	5.40	- 2.13	4.47	- 1.73
10.	6.20	- 2.20	5.13	- 1.80
15.	7.27	- 2.07	6.0	- 1.73
20.	7.87	- 1.53	6.60	- 1.20
25.	8.20	- 1.07	6.87	- .87
30.	8.40	- .73	7.0	- .60
35.	8.40	- .53	7.0	- .40
40.	8.27	- .40	6.87	- .33
50.	7.60	- .47	6.33	- .40
60.	6.60	- .67	5.53	- .53
70.	5.33	- .73	4.40	- .60
80.	3.80	- .53	3.13	- .47
90.	1.93	- .33	1.60	- .27
100.	.05	- .05	.04	- .04

% STA.	GRANT "X-14" % U.C.	GRANT "X-14" % L.C.	GRANT "X-16" % U.C.	GRANT "X-16" % L.C.
0	0	0	0	0
1.25	1.37	- .67	1.20	- .20
2.50	2.13	- .93	1.87	- .80
5.0	3.10	- 1.33	2.67	- 1.13
7.50	3.83	- 1.50	3.33	- 1.27
10.	4.40	- 1.53	3.80	- 1.33
15.	5.17	- 1.47	4.47	- 1.27
20.	5.60	- 1.10	4.87	- .93
25.	5.87	- .77	5.07	- .67
30.	6.0	- .50	5.20	- .40
35.	6.0	- .37	5.20	- .33
40.	5.90	- .30	5.13	- .27
50.	5.40	- .33	4.73	- .27
60.	4.73	- .47	4.07	- .40
70.	3.80	- .53	3.27	- .47
80.	2.67	- .40	2.33	- .33
90.	1.40	- .23	1.20	- .20
100.	.03	- .03	.03	- .03



Aviation Advisory Board

Conducted by
CHARLES HAMPSON GRANT
Chairman of the Board
Formerly of
The Technical Section, Air Service, U.S. Army

FOR several months the Advisory Board has not appeared in MODEL AIRPLANE NEWS. So, undoubtedly, the reappearance of this page will be a very pleasant surprise to many readers. It appears that there are still many things that model builders wish to know, for this department has been flooded with many queries. We take pleasure in answering a number of the most important ones.

First, we have a letter from R. C. Thomas of Allenton, Illinois. Mr. Thomas wishes to know:

Question: How can I shrink the tissue covering on my models so it will be tight and smooth? The methods I have tried have not been successful.

Answer: Usually this is a very simple matter. Before attempting to tighten the paper, it is well to observe an important point in fastening the paper to the frame. Banana oil should be used for this procedure or very thin cement, just enough should be used to hold the paper firmly in place. If too much is used the cement will smear over the paper which extends beyond the wood of the frame. This will cause an uneven and wrinkled covering. To tighten the paper, spray lightly and evenly with water over the entire surface. Then set it aside until it dries. The paper will dry tight and smooth. A coat of banana oil then may be applied. Often several coats of banana oil are applied without using the water tightening method.

It appears that Stephen Vise of 6319 Ridgeland Avenue, Chicago, Illinois, is a very inquisitive young man and yearns for knowledge, for he has given us a list of about twelve questions which he would like answered. Undoubtedly the answers to some of these questions will be helpful to a large number of readers.

Question: What is an aspect ratio?

Answer: There is no such thing as "an aspect ratio." There is however a quality or characteristic of an airplane called "the aspect ratio." It is the relationship between the span and the chord of the wing, or in other words it is the span divided by the chord. If the span is twenty-four inches and the chord four inches, the aspect ratio is six inches.

Question: How can the amount of lift be determined?

Answer: The calculation of the lift of an airplane is a rather involved and lengthy procedure. The customary method is to test the wing in a wind tunnel and determine a lift coefficient. This coefficient is then inserted in a formula, which is:

$$L = C_L A V^2$$

In the formula L equals the lift, C_L equals the lift coefficient, A is the wing area and V equals the velocity at which the plane travels in miles per hour. Considerable information is required if one is to use this formula, which data may be obtained from textbooks found in the library. This formula is rather involved for the calculation of the lift of a model wing. Heretofore there has been no simple method of determining this lift.

However a formula has been developed by Mr. Charles Grant, which appears in the March 1932 issue of MODEL AIRPLANE NEWS. It is simple and gives approximate results for a model wing of any camber, and is as follows:

$$L = (0.002)\ \frac{(3\,C_a + C_B)}{4}\ A\ V^2\ \frac{(4 + I)}{6}$$

In the formula (L) equals lift in ounces, (C_B) is the height of the lower camber relative to the length of the chord, (C_a) is the height of the upper camber relative to the length of the chord, (A) equals the area of the wings in square inches, (V) equals speed of the plane in miles per hour, (I) equals the angle of incidence of the wing. Usually this angle is about two to three degrees. By substituting the proper values for these quotations in the formula, the equasion may be solved for the value of (L), the lift. You will find that it is surprisingly accurate. This formula is the only one of which we know that is accurate and may be applied to model planes in a simple manner.

Question: How can the wing loading per square inch be calculated?

Answer: The wing loading is the number of pounds carried by the wing per square inch and it may be determined by dividing the total weight of the airplane by the number of square inches of wing area.

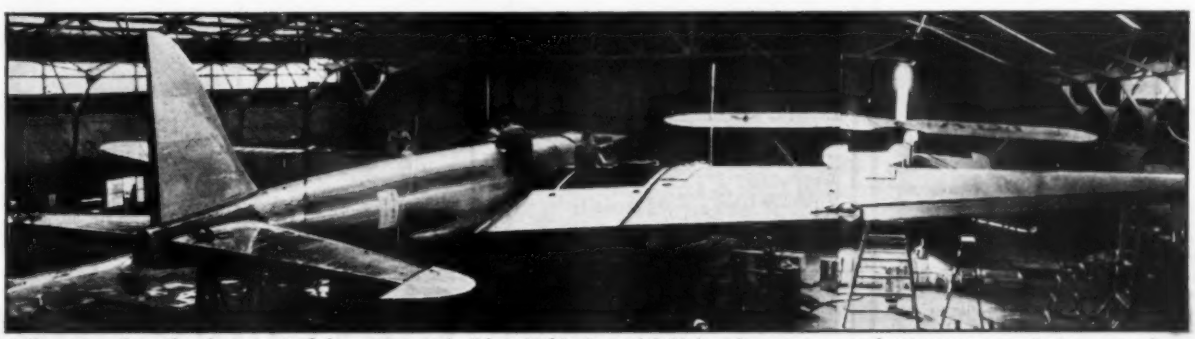
Question: How can the gliding angle be determined?

Answer: The gliding angle of a plane can be determined only by actual tests, unless very intricate resistance calculations are undertaken. Usually these are beyond the knowledge of the majority of model builders. The gliding angle of the wing alone, not including the structure of the airplane, is proportional to the lift-drag ratio. If the lift is twenty and the drag is one, then the gliding angle will be twenty to one.

Question: How can the center of pressure be found?

Answer: The center of pressure can only be found accurately by means of wind tunnel tests. This center changes its position as the angle of attack of the wing changes. It also is in a different position on different types of airfoils. The average position of the center of pressure at two to three degrees is about thirty to thirty-five percent of the chord back from the leading edge of

(Continued on page 60)



A Japanese plane that has required four years to build at Tokio Imperial University, at a cost of 1,000,000 yen. It is expected to fly 10,000 miles non-stop in 80 hours. (Acme)

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3	DeHavilland-4	2.85	.95	
4	Curtiss "Jenny"	2.65		
5	Laird Super-Solution	1.95	.65	
6	Polish Fighter	2.50		
7	Curtiss Helldiver	2.95		
8	Army Boeing P12-E	2.25	.75	
9	Scouting SE-5	1.25	.35	
10	Sopwith Camel	1.95		
11	A-W Quad Fighter	1.95	.65	
12	Bishop's Nieuport	1.95	.65	
13	Sond '13	1.95	.65	
14	Fokker Triplane	1.95	.65	
15	Fokker D-7 Fighter	2.50	.75	.65
16	Albatross D-5A	1.95		
17	Bayles' Gee-Bee	1.95	.65	
18	Howard "Pete"	1.25	.40	
19	Supermarine S6-B	1.95	.80	
20	Hawker Fury Fighter	1.95	.80	
21	Hawk P6-E Fighter	2.50	.95	.65
22	Macon Fighter	1.95		
23	Boeing P-26 Pursuit	1.95	.70	
24	Lockheed Vega	2.50	1.20	
25	Curtiss A-8	2.50		
26	Heath Parasol	1.25	.35	
27	Doolittle's Gee-Bee	1.95	.65	
28	Monocoupe Sport	1.95	.65	
29	Boeing P4B-3 Fighter	2.25	.80	
30	Nieuport 28 Fighter	1.95		
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32	Boeing 95 Mail	1.95	1.20	
33	Comper Swift Sport	1.25	.45	
34	Fokker D-8 Fighter	1.95	.55	
35	Boeing 247 Transport	5.95	2.95	
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37	Waco C Cabinplane	2.65	.95	
38	Buhl Bull Pup	1.65		
39	B-J P-16 Fighter	2.75		
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45	Martin Bomber	6.50	2.95	
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49	Curtiss F11C-2	2.95	1.10	
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51	D. H. Comet Racer		1.35	
52	"Mr. Mulligan"	2.35	.65	.65
53	Grumman F2F-1 Fighter			.65
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58	Ryan ST			.65
59	Hawker Low Wing Fight.			.65
60	Boeing P-26-A	2.65	1.10	
61	Seversky Fighter	2.65	1.10	
62	Custom Waco C6		1.10	
63	'36 Caudron Racer	1.95	.65	
64	Beechcraft C-17-R		1.10	
65	Lockheed Electra		2.75	
66	Stinson Reliant			.65
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68	'17 Bristol Fighter		.95	
A	Pontoon Kit	.35		
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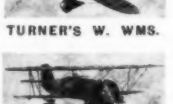
HOWARD RACER "IKE"

DOUG. O-38 OBSERVATION

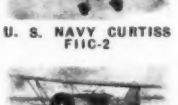
LAIRD SOLUTION RACER

WEDELL'S W. WMS.

TURNER'S W. WMS.



U. S. NAVY CURTISS F11C-2



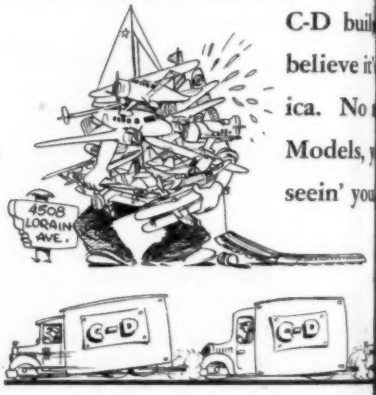
TURKEY HAWK

IMPORTANT!

New dealers all over the country are switching to the C-D line, so before ordering direct, go to your own dealer and see if he can't supply you. If he can't, order direct from us (but PLEASE mention your dealer's name, so we can offer him the C-D proposition). In ordering direct, remember that all transactions are subject to our regular catalog shipping instructions, most important of which are: Send check or M.O. (cash at own risk). No C.O.D.'s. Add 15c packing charge to ALL orders for parts. Canada, Mexico, British Isles, add 10% to ANY order sent to us; all other countries, 20%.

WE'RE M

We expanded in the old quarter till bursting at the sides and roof—t s needed room. So-o-o-o we recently pur a large building where we'll have all room we need to give bigger, be er quicker service than ever. If you're co ing to Cleveland this summer—or ny ti —make our Model store your headqu ters. It's located on the ground floor of



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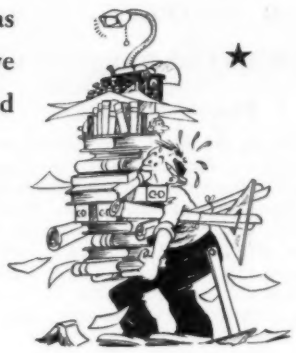

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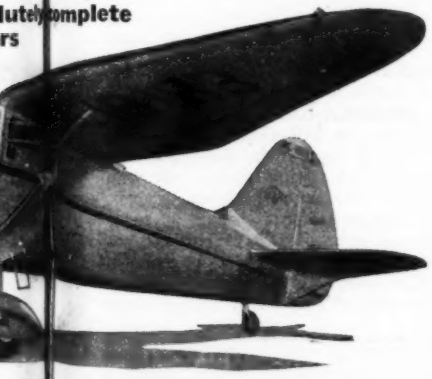

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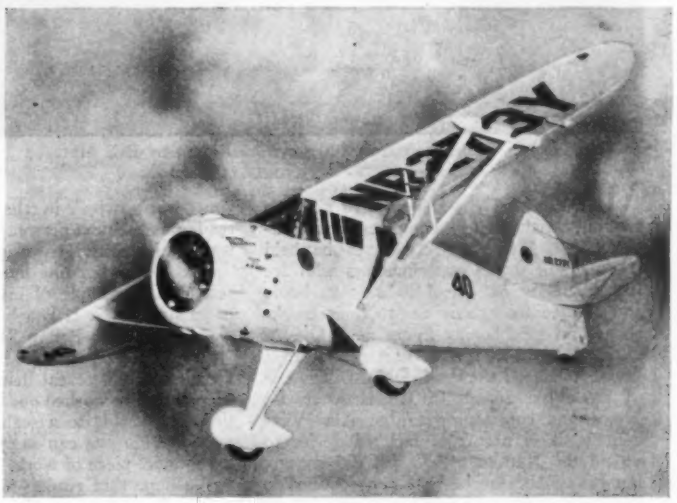

1935 Thompson Trophy Winner

MISTER MULLIGAN

The C-D Mailbag

From G. C. W. of Georgia: "This is my first experience at modelbuilding. I've helped build many real Switching Engines in the PRR shops, so I'm ordering your Kit of that model. Must compliment you on its realistic appearance." Thanks, G. C. W.—if everybody ordered from C-D **FIRST**, there'd be much fewer headaches among modelbuilders. We get letters all the time, speaking of disappointing experiences, and ending with the decision of trying C-D. Our only comment is a lot of money could be saved if more modelbuilders would try C-D **FIRST!**

H. F. B. of New York City writes: "The clear, understandable descriptions in your catalog are in themselves lessons in modelmaking. Your ad copy has a brilliancy and appeal that makes one feel there is a firm that doesn't just want to sell things—they want you to enjoy them!" We might just mention in passing that C-D has pioneered more successful developments in modelbuilding than most other companies combined. You see, we're hobbyists ourselves—not simply commercial minded.

Here's what C. C. G. of the Canal Zone says: "I'm awarding C-D Kits as prizes in my Club contest. Most members are C-D builders, and I know of 5 who told me that as long as they're building models, all are going to be C-D's." Well, we ought to keep them busy for quite a while on just airplanes alone, as we have the largest line in the world. And more to come.

Good old San Antonio speaks through J. H.: "I've built 8 of your models, including a Douglas Transport and Lockheed Electra, and am planning on getting the '24' and several more, as C-D's are tops!" Thanks, J. H.; them's our sentiments, too. We'd like to use the Buick slogan, but they discovered it first. If you can think up a good one, let's have it.

R. L. B. of Maine brings this orchid: "I have built 63 models, and I find the Beechcraft I obtained from you is the best yet. I am going to order from you from now on." Aboy, R. L. B., that just bears out what we said in our comment to the letter from G. C. W. of Georgia, printed above. Tell your friends to try C-D **FIRST.**

From Idaho, R. F. C. writes: "Very well pleased with the Supplies and the 13 R. R. Kits—especially the Locomotives. The Hiawatha train is a WHIZ!" no kiddin', these C-D RR Kits are sweet. Anyone who hasn't tried one yet is missing a lot of fun and enjoyment.

PONTOONS With suggestions for attaching to other types of SF models besides the Aeronca for which it was purposely designed. Also fits Ryan Speedster and other Reps. Materials for struts and two Pontoons supplied. SF-A complete dry kit..... **35c**

CURTISS HAWK P6-E FIGHTER

FOKKER D-7 FIGHTER

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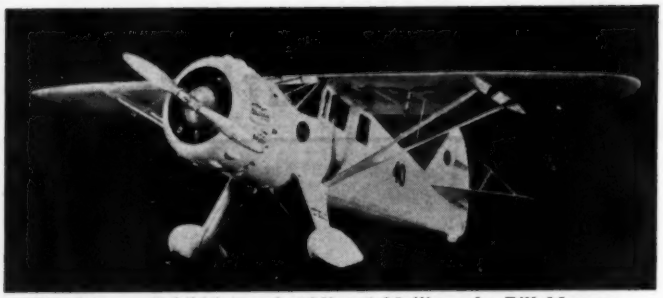


Pict. No. 1. Exhibition scale "Mister" Mulligan, by Bill Metzger

AIR WAYS

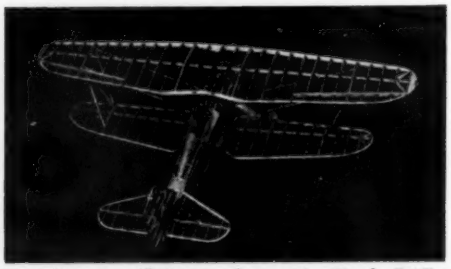
HERE AND THERE

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World. Tell Others What You Are Doing

MANY model champions have gone to Detroit, Michigan, to compete in the national model airplane classic to be held there. Other model experimenters who are less fortunate have had to stay at home and confine their activities to their workshops and neighboring flying field. One of these young men is Bill Metzger of 1547 Mars Avenue, Lakewood, Ohio. Bill is one of the oldest friends of MODEL AIRPLANE NEWS and contributor to the Air Ways column. It is not from lack of desire to attend the Nationals that Bill did not go, but rather because he has been confined to bed for a number of years.

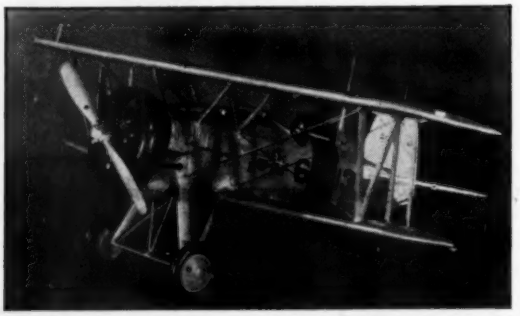
He takes the greatest interest in everything pertaining to aviation and can tell you "who's who" in the model field as readily as the next person. Bill has not been wasting his time. His spare moments have been occupied building models of every description. A sample of his work is shown in picture No. 1. It is a built-up exhibition scale model of Benny Howard's famous "Mister" Mulligan. Close examination of the picture will reveal that every detail has been carefully worked out in proper proportion. It is made to a scale of half inch to the foot. No one can say that it is not an exceptional piece of work.

We hope that readers will keep Bill acquainted with events of interest that occur in the model world. He would be very pleased to see anyone who lives near his home should they care to call.



Pict. No. 2. Skeleton of a scale Hawk P6-E containing 1000 pieces. By Clyde Wiley

Picture No. 2 shows the skeleton of a Hawk P6-E. This fine model is the work of Clyde Wiley of 264 Rutland Street, Middleport, Ohio. Clyde's activities are also restricted inasmuch as he is a cripple. He tells us that he is most anxious to hear from other model builders.



Pict. No. 3. A perfectly scaled Boeing F4B-4 by Robert Rice of Unit No. 9, a beautiful piece of work

CLUB NEWS
Findlay, Ohio

Mr. A. B. Fruchey of 448 Center Street, Findlay, Ohio, leader of the Findlay Model Aviation Club, Air Ways Club unit No. 9, contributes picture No. 3. It shows a fully detailed F4B-4, built by Robert Rice, a member of this club. This is one of the finest pieces of detail work we have seen in a long time. Anyone interested in speed models should get in touch with this club, for it is probably the most outstanding club in the construction and flying of this type of model in the country. Watch for news of their activities.

Air Ways Club News

Detroit, Michigan

Gordon A. Scheill of 1676 Richton Avenue, Detroit, Michigan, sends us picture No. 4, showing a group of contestants in a recent model contest held by the "Algonac Courier." The contest took place in the Algonac High School gymnasium. Left to right, top row: Jack Drouillard, Barrett Rawnsley, Ed Mackenson, Bob McAuslin, Murry Longstreth, Ed Jankow. Bottom row: Elmer King, Hugh Rawnsley, Bill Simms, Bill Moran, Tom Koebel.

Mr. Scheill says that the members of this club are unusually anxious to hear from other Air Ways Club members. Their contest was a complete success. In his letter Mr. Scheill tells us of a rather unusual method of controlling his gas model. If he finds that it is "going places" too quickly, he restrains the flight by pulling on a light fish line which is tied to the tail wheel assembly. The model then returns to earth. Little maneuvering is required in order to land it successfully in this manner.

Rockford, Illinois

Dr. Spickerman of the Pla-Mor Wings, the Junior National Aeronautical Association Chapter of Rockford, sends us picture No. 5. It shows a group of model builders is active in this town. If anyone is interested in joining this club, they should contact Dr. Spickerman at 1104 Talcott Building, Rockford, Ill.

Illinois

Picture No. 6 shows one of the most unusual models we have ever seen. It is a flying scale model covered with microfilm. It was built by Bill Gough, Jr., of the Illinois Model Aero Club. This little ship won the I.M.A.C. flying scale trophy with a flight of one minute, eleven seconds. Though the propeller is small, it turns only at the rate of 800 revolutions per minute. The ship is an exact scale model of the G.B. sportster "D". Builders familiar with microfilm covering will appreciate the

Pict. No. 7. An exhibit of models held recently by the Hastings Model Club of New Zealand. Gordon Smith is director

Pict. No. 8. Contestants who participated in the recent Manila, P.I., model contest. They are doing fine work

Pict. No. 5. The Pla-Mor Wings N.A.A. Chapter of Rockford, Ill., gets ready for the National Contest

Pict. No. 4. A group of contestants in recent "Algonac Courier" contest held at Detroit, Mich.

careful workmanship that had to be put forth in covering this ship. It even has microfilm fillets at the wing stub. Mr. Frank J. Paryhaza, publicity director of the club, is responsible for this information. He writes us that the I.M.A.C. is planning a "mass attack" on the trophies at the National contest. They have eight gas models in various stages of construction. A glance at the account of the Nationals will tell you how successful the club was in carrying out its intentions. This club extends an invitation to all model builders to visit their clubroom at the Auditorium Hotel, 143 South Michigan Boulevard, Chicago, Illinois. Meetings are held on the first and third Friday of each month at 8 P.M.

Saint Louis, Missouri

Mr. H. T. Sommers, director of the Stix Baer & Fuller Model Airplane Club of St. Louis, writes and tells us to be sure and bring notice of the Mississippi Valley Model Airplane Tournament to all readers. This contest will be held on September 3rd, indoors at the Arena, and outdoors at Parks Air College on the 4th. The senior events will be fuselage, stick and gas model outdoors, and stick indoors. The junior events will be fuselage and stick outdoors, and stick indoors. A test contest will be held on August 28th in Forest Park in the afternoon.

Hartford, Connecticut

Alfred W. Schmidt of 29 Vernon Street, Hartford, Conn., a member of the Model Aero Engineers of this city, writes and tells us of their activities in the annual Connecticut Model Aircraft contest. He says:

"The Ninth Annual Connecticut Model Aircraft Meet sponsored by the United Aircraft Corporation and sanctioned by the National Aeronautic Association was held June 5th in which more than 120 model airplane builders from all parts of the state of Connecticut competed for prizes.

"Our organization called the Model Aero Engineers of Hartford which was organized in September, 1936, had several of its members entered in this contest. We were represented in every event except the two gasoline model events, and out of a possible 18 places our club obtained 14. A fine record for any model club. All first prize winners received trophies while the second and third prize winners received medals. The names of our members who won prizes and the events with the places they won are as follows:

Solid Scale Event

Senior Class

1st—Edward Brant
2nd—Edwin Goral
3rd—Thomas Hogan

Junior Class

2nd—Helmuth Baumann

R.O.G. Commercial Event

Senior Class

3rd—Edward Rosen

Junior Class

1st—Charles Downey
2nd—Theodore Sanko
3rd—Helmuth Baumann

Stick Model Event

Senior Class

1st—Joseph Borcynski
2nd—Edward Rosen
3rd—Tades Spelis

Junior Class

1st—Henry Borcynski
2nd—Oscar Boyajian
3rd—Frank Lattanzio

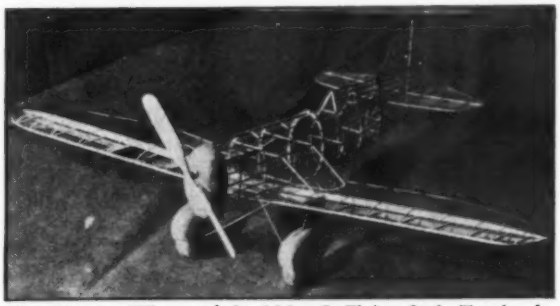
"All of these members reside in Hartford and all events were outdoor events. The two major group awards which were trophies presented by the United Aircraft Corporation were given to Joseph Borcynski of the Senior Class and Charles Downey of the Junior Class. Edward Rosen obtained a Baby Cyclone gasoline engine for second place in the Senior Class."

It appears that this club "cleaned up" at this contest.

Ontario, Canada

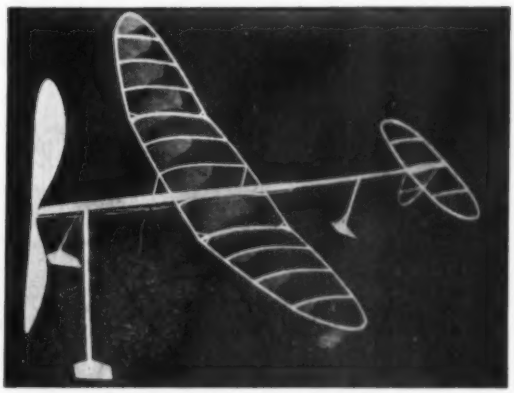
Our old friend, John T. Dilly of 34 Aberdeen Road North, Galt, Ontario, Canada, sends us the results of the annual Eaton model aircraft contest held in Toronto under the direction of Mr. Frank Luces of the Ontario Model Aircraft. In this contest Vern Anthony, J. Milligan and E. Barrie won all the expenses to cover the trip to the Nationals at Detroit. The winners of the contest are as follows:

Don McIntyre of Guelph won the R.O.G. event with a time of 7:07. The Commercial event went to Jim Haffie of Toronto with a flight of 7:57. Ernest Barrie of Galt won the Tractor event with a 12:15 flight and J. Templeton of Toronto won the Semi-Scale event. All these were indoor events. In the outdoor division the winner of the Gas Job flight was Vern Anthony of Toronto with a time of 11:08. The Wakefield (4 oz.) event went to Ray Smith of Toronto with



Pict. No. 6. Winner of the I.M.A.C. Flying Scale Trophy, by Wm. Gough, Jr. It weighs ½ oz. and is microfilm-covered

Pict. No. 9. K. Duke's winning model in full flight in South Africa. A fine shot



Pict. No. 10. W. B. Mackley's New Zealand record holding indoor hydro. Record time, 4 min., 46 4/5 sec.

a 1:27 flight. A Corfield of Port Dalhousie won, with a time of 1:33, the Moffett (8 oz.) event. John T. Dilly of Galt was first in the Stick event with a 1:48 flight. The Wakefield, Moffett and Stick times listed here are an average of three flights.

MODEL NEWS FROM OTHER COUNTRIES

New Zealand

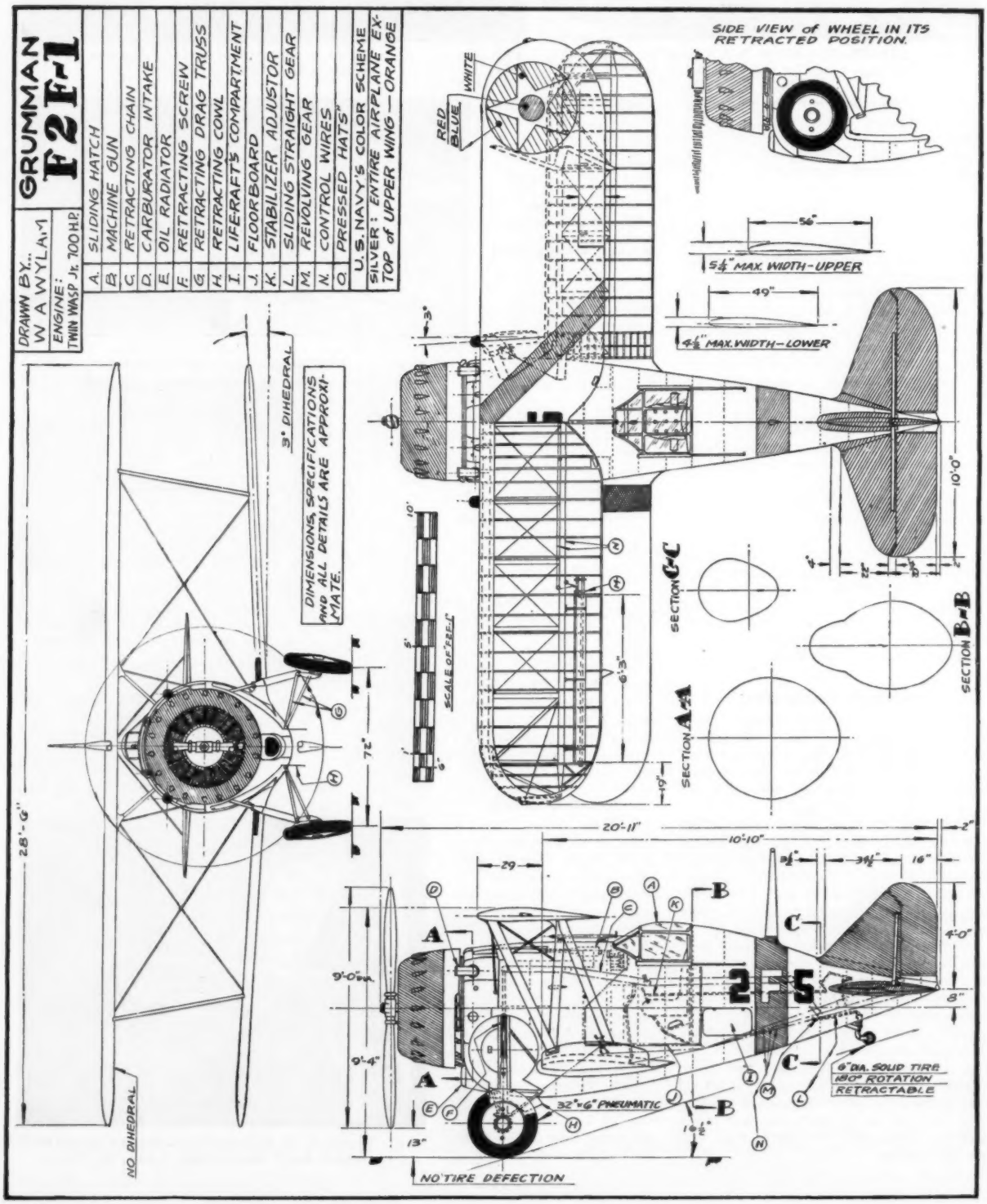
Mr. Gordon P. Smith of New Plymouth, New Zealand, P.O. Box 260, has kept us well supplied with news from the country on the other side of the globe. He sends us picture No. 7 which shows an exhibition held by the Hastings Model Club, of which Mr. Williams is president. There are 23 planes and gliders on exhibition, as well as the trophy shown in the picture. He also sends news of other activities, which is:

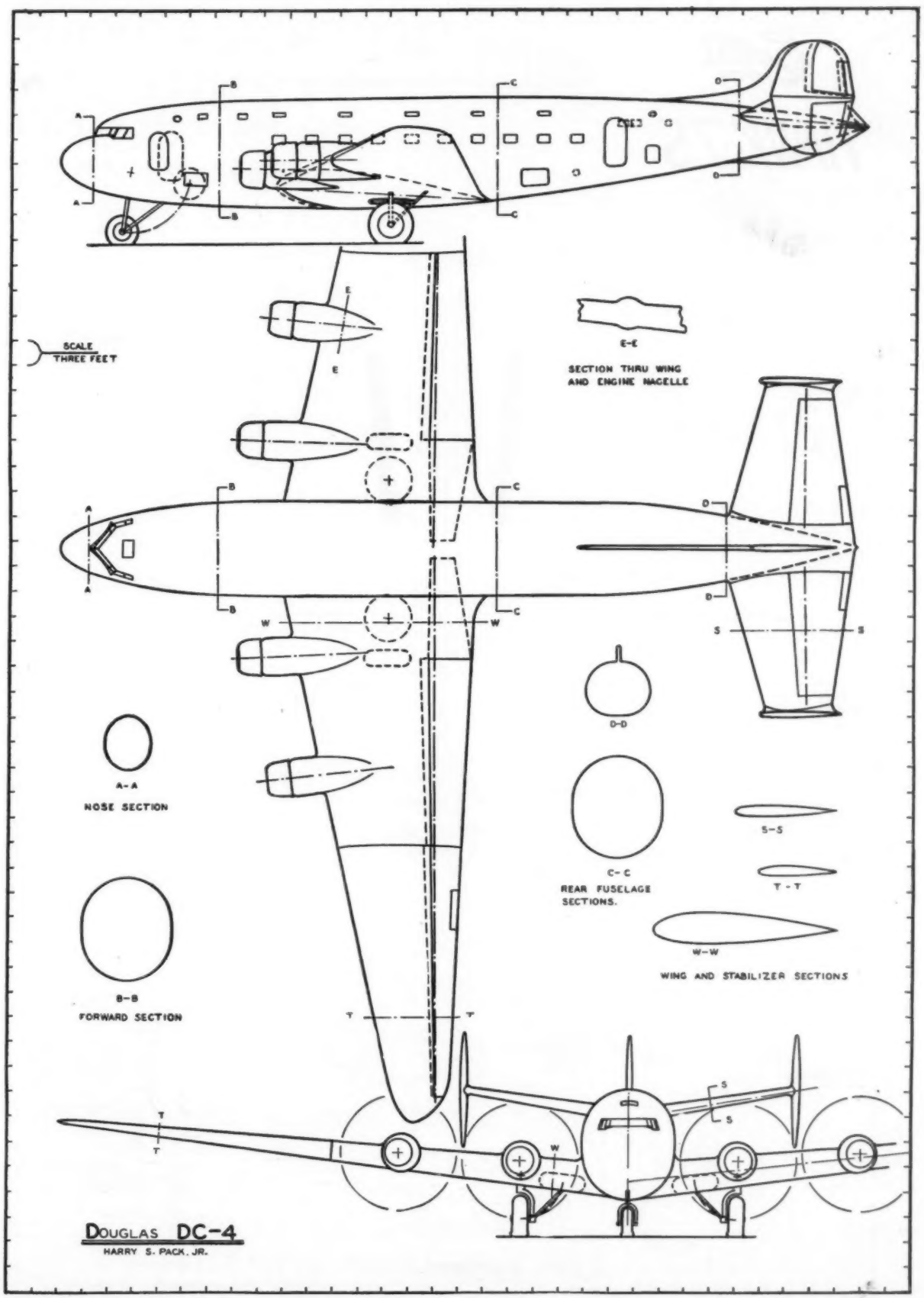
"At Easter the Taranaki Union of Model Flying Clubs did not hold their usual Easter contest, it was postponed till the following Saturday on account of the very boisterous weather. On the following Saturday the following events were run off:

Glider—Hand-launched and Tow-line, also a Marathon Race.

Stick Models—H.L. and R.O.G. Speed,

(Continued on page 56)

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THREE FEET
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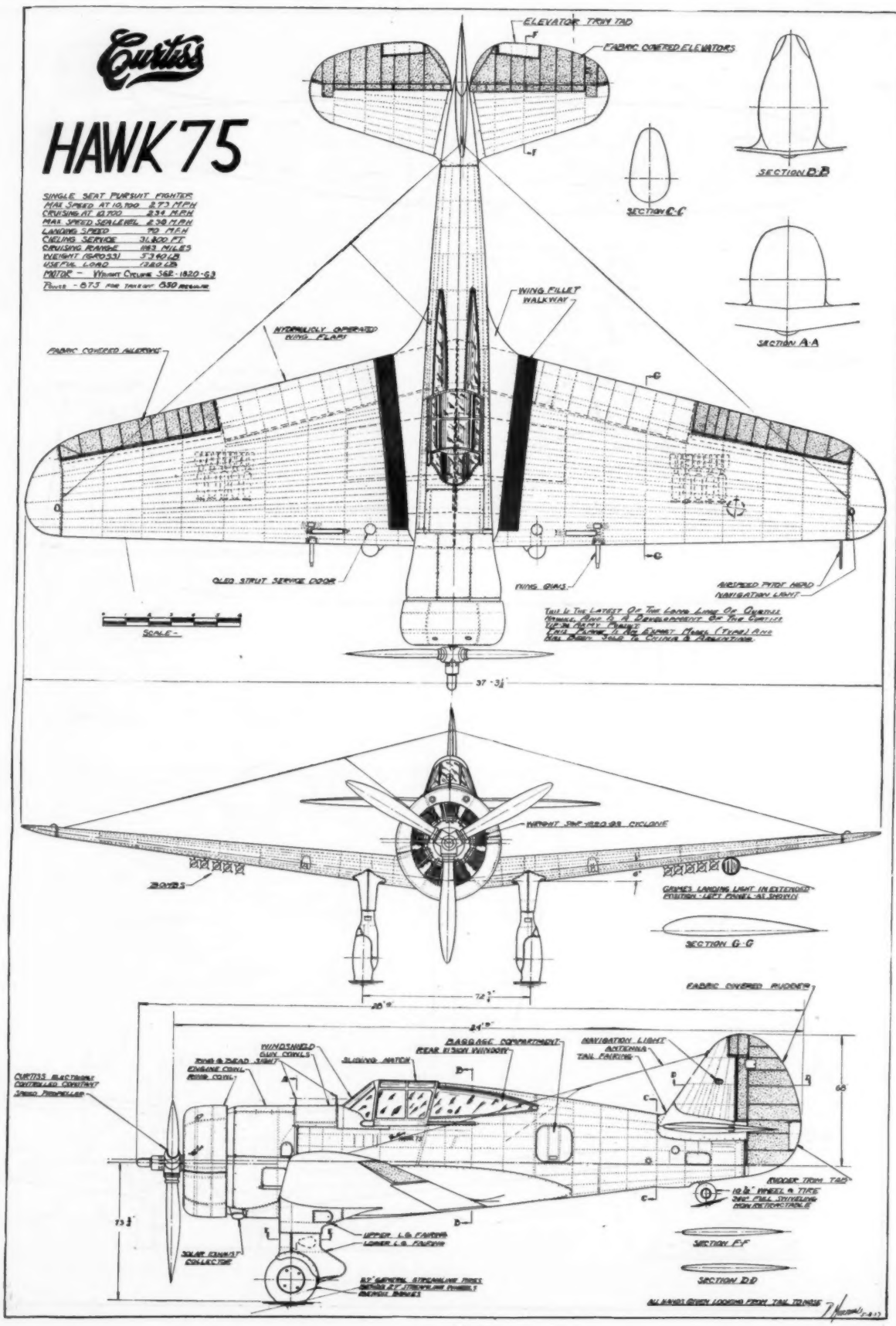
SECTION THRU WING
AND ENGINE NACELLE
D-D
A-A
NOSE SECTION
S-S
C-C
REAR FUSELAGE
SECTIONS.
T-T
W-W
WING AND STABILIZER SECTIONS
B-B
FORWARD SECTION
DOUGLAS DC-4
HARRY S. PACK, JR.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HAWK 75
SINGLE SEAT PURSUIT FIGHTER
MAX SPEED AT 10,700 273 M.P.H.
CRUISING AT 10,700 234 M.P.H.
MAX SPEED SEA LEVEL 238 M.P.H.
LANDING SPEED 70 M.P.H.
CEILING SERVICE 31,800 FT.
CRUISING RANGE 883 MILES
WEIGHT (GROSS) 5740 LB.
USEFUL LOAD 1280 LB.
MOTOR — WRIGHT CYCLONE SGR-1820-G3
POWER - 875 FOR TAKEOFF 850 RECOMM.
ELEVATOR TRIM TAB
FABRIC COVERED ELEVATORS
SECTION B-B
SECTION C-C
SECTION A-A
WING FILLET WALKWAY
HYDRAULICLY OPERATED WING FLAPS
FABRIC COVERED AILERONS
OLEO STRUT SERVICE DOOR
WING GUNS
AIRSPEED PITOT HEAD
NAVIGATION LIGHT
SCALE -
37'-3½"
WRIGHT SGR-1820-G3 CYCLONE
BOMBS
GRIMES LANDING LIGHT IN EXTENDED POSITION - LEFT PANEL AT SHOULDER
SECTION G-G
FABRIC COVERED RUDDER
WINDSHIELD GUN COWLS
SLIDING HATCH
REAR VISOR WINDOW
BAGGAGE COMPARTMENT
NAVIGATION LIGHT
ANTENNA
TAIL FAIRING
CURTISS ELECTRICALLY CONTROLLED CONSTANT SPEED PROPELLER
RUDDER TRIM TAB
10½" WHEEL & TIRE
SWIVEL RETRACTABLE
UPPER L.G. FAIRING
LOWER L.G. FAIRING
SOLAR EXHAUST COLLECTOR
SECTION E-E
SECTION D-D
ALL RANGES GIVEN LOOKING FROM TAIL TO NOSE

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MAXWELL BASSETT'S CHAMPIONSHIP MODEL

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Miss Philadelphia

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The outstanding Gas Model of all time—Designed by a famous Contest Winner and offered by SCIENTIFIC so all Model Builders can have an absolute duplicate of this prize winning model. Kit is 100% complete and includes ready shaped leading and trailing edges for wing with the notches cut for ribs; fully finished 14" propeller; pneumatic rubber wheels; finished Balsa ribs with notches for spars. Crackproof landing gear; flexible wing supports; high wing stability; beautiful blue and yellow coloring. Can be powered with any standard gas engine. A sensational model easy to build with this complete SCIENTIFIC kit.

$9.95 Postpaid Less motor

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First Prize Winner I.G.M.A.A. Contest

Miss America won First Prize in the 40 sec. limited event at Hadley Airport May 22, 1937. Another Miss America is winner of Grand First Prize at Metropolitan Gas Model Meet at the same airport. This model is a reliable consistent performer in the air, and gives a good account of itself at every model gathering. Designed by America's foremost model designer. Kit is complete with every item required, including 3½" pneumatic rubber wheels, finished hard wood gas model propeller and all other materials required. If you want a reliable flyer for general sport anywhere, ask your dealer to show you this model. Complete kit.....

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AMERICA'S FINEST POPULAR PRICED GAS MODEL

Wing Span, 6 Ft.; Weight (less Motor), 2½ lbs.; Length, 56 In.

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3½" Size for Models 3 to 8 Ft. Black rubber, Aluminum Colored Hubs. Per Pair **$1.50**

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1/8x1/4	4c
1/8x3/8	6c
1/8x1/2	6c
3/16x3/16	4c
3/16x1/2	8c
1/4x1/4	6c
1/4x3/8	8c
1/4x1/2	10c
3/8x3/8	10c
1/2x1/2	12c
1/2x3/4	15c

SHEET BALSA

5 ft. Lengths	Each
1/32x2	10c
1/32x3	15c
1/16x2	12c
1/16x3	18c
1/8x2	15c
1/8x3	20c
3/16x2	18c
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1/4x2	20c
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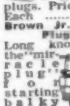

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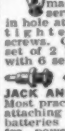

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An Experimental Flyer For Novice or Expert

(Continued from page 9)

Now connect all the dots, top and bottom. It is not necessary to draw the parallel lines representing the longerons and braces if one is careful. The two fuselage sides may now be built from the drawing. To assemble the sides, obtain the dimensions of the horizontal cross-braces from the top view. When the simple framework is finished, make the tail hook former as per directions on the smaller drawing. When this is dry, insert the tail hook and install the whole thing in place in the framework. Now make the bamboo "V" shaped front window.

The wire landing gear bridges are made of .034 music wire and are attached as shown in the lower left hand corner of the plan. The wheels may now be made as shown in the drawing, and attached. The fuselage is covered with 1/32" medium sheet balsa. Two patterns of the side view of the fuselage are cut on some of the sheet. In the correct position, cut out the windows. On the side of each sheet that will face the inside of the fuselage when in place, cement a small strip of celluloid to simulate the window panes. The front window is also covered with celluloid. Now cement the two sides to the body and hold in place with pins till dry. Do not forget to leave an opening on one side near the tail hook to permit access to the motor. When the covering on the sides is dry, remove the pins, and cover the top and bottom with 2" sheet. This is also held pinned in place till dry, then it is trimmed and all four corners generously sanded till round. This provides a minimum of drag and makes for a very pleasing appearance. The hard balsa nose plug is now made. Make the plug tight fitting and finish sanding the plug while in the nose; this will give it a molded appearance as well as a good streamline effect. The tail block is also finished after being glued in place. Now finish down the body with 10 nought and apply two to three coats of banana oil.

Propeller and Motor

The propeller is cut from a block of medium hard balsa, the dimensions being 1" x 1½" x 9". For layout see plan. The motor power consists of 8 strands of ⅛" flat brown lubricated rubber. Allow about 4" slack.

Assembly

The tail is cemented to the top of the tail block on which it will have an angle of incidence of —2 degrees. The wing is held in place by a single rubber loop. A ⅛" incidence block is put under the leading edge, which comes up to the back edge of the "V" window.

Flying

The model should circle *WITH* the torque, that is, toward the launcher's left after release. Adjust the rudder till the right attitude is obtained. If the model tends to nose down, increase the incidence in the wing, though it is doubtful whether this will occur. If it stalls, move the wing back or slightly decrease the incidence. For a good flight "wind-in" 600 to 800 turns.

How Much Gas?

(Continued from page 7)

design and build a structure that will be lighter than the other fellow's, and still be as efficient in performing its job. In commercial aviation, such carefully made ships are in constant demand because they permit a higher payload, with correspondingly greater profits. Should we not encourage and reward such work with greater gas allowance? Certainly, it would be no more than fair that it should receive at least as much gas as careless designing which results in a heavy job.

The displacement system of the American Legion contest has the defect of giving the advantage to the small model. Here, all engines of like displacement (such as the Hurleman, Tlush, Brown, etc.) are given exactly the same amount of fuel, regardless of the weight or size of the model. Suppose two models are built with the same aerodynamic design, one a six foot job, and the other a nine footer, and with equal wing loading for both. Each is powered with a Brown. Now, according to our ideal standards for contests, these ships should tie one another since they are equally efficient in design and construction. Yet going by this rule, we know that the small job would win every time, for the simple reason that it can climb much faster and higher. Thus we can see that this method imposes an unfair handicap on larger models.

The 45 second motor run idea sounds good on paper, so to speak. It would make it appear that the model will always start its glide before it gets high enough to catch risers and start a cross-country trek. In actual practice, however, difficulties come up which make it unworkable. Many ships in existence today can climb 750 feet in 45 seconds, high enough so that it would be very difficult to ascertain the actual motor run in the heat of a contest. Also, in a short time ships would be developed to climb at the rate of several thousand feet in the first minute, making it absolutely impossible to be sure the motor did not exceed the prescribed run, to say nothing of the fact that it could go completely out of sight with such altitude. Just picture the climb of a five foot model powered with a Forster! Also, no incentive is offered to motor manufacturers to better their products, which certainly is necessary.

The Gotch Airport meets were undoubtedly most interesting. However, for the same reason that it is not feasible to keep records of scale models and so-called flying scale models, this type of contest would be distasteful to most model builders. The difficulty lies in the fact that human judgment and the errors that invariably go with it, awards 80% of the points given each model.

It is less easy to criticize the method proposed by the British. We have a bad start in not knowing the details of their system, but let it suffice to say, for the present, that the largest defect, apparently, is that effective control of flight would be the only thing developed, rather than better structures, better engines, and more aerodynamically efficient designs. A thoroughly

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streamlined model would have no more value than the clumsiest looking box job.

Apparently, none of these methods can prove satisfactory in the long run. What, then, may be the ideal toward which to strive? Obviously, the answer is to find some means that will be pretty sure to tie models of equal caliber. It should so reward strong points in design, construction or flying that the model which best combines aerodynamic and engine efficiency will win nearly every time. There are a number of tests of efficiency. Speed, altitude, weight-carrying, distance and duration are major tests, and they are all equally good. But from the practical angle, it is next to impossible to run contests for gas models on the basis of speed, altitude or distance. Weight-carrying might prove a good method, if sufficient meets were run to develop a good set of rules for it. The most practical at the present is the duration method, which brings us back to the problem of fuel limitation.

At one of the very first gatherings of the Gas Model Aeronauts, an organization meeting at Gage Park, Chicago, Illinois, Melvin Yates, well-known gas model expert, made a proposal which sounded so odd that none, including the author, paid more than slight attention at first. This suggestion simply was that fuel be allotted according to wing area, at the rate of one-sixteenth ounce per square foot. At first, we all scoffed, because the idea seemed so radical and ridiculous on the surface. Afterwards, the more one thought about the matter, the more attractive it became. What at first appeared to be weak points soon showed their strength. This is perhaps the most reasonable of all proposals yet made; its value can be shown by the following simple proofs.

First of all, it does not handicap the careful designer who strives scientifically to cut down his model's dead weight.

Secondly, it is thoroughly practical for contests. Wing area is easily measured, and cannot be cheated like the weighing method, where contestants have been known to remove heavy lead weights after the model had been checked.

Third, this method definitely will tend to produce better engines. If two models are exactly equal except for *engine efficiency,* this will show up in the contest, since both get the same amount of gas. Similarly, if two models of the same size differ in aerodynamic efficiency, the superior one will win.

Fourth, it will not give any advantage to either the large or the small ship, and thus will avoid creating a trend towards either. Consider two models built to the same design, one a four footer, the other an eight footer. One would probably use a ½ inch bore motor for the small ship, and a ⅞ bore for the larger one. If the small one has two square feet of wing area, it will get one-eighth ounce of gas, which is sufficient to run the motor between five and six minutes. The large model, then, would have a wing area of eight square feet, and would get one-half ounce of gas, which would run its motor for five to six minutes also. Thus, we see that, in spite of the great difference in size and weight, the two ships would have approximately equal motor runs; and since they would be proportionately powered, the rates of climb would also be about the same. Because it is so much easier to make a small ship light, it is also likely that the wing loadings of the two ships would be pretty nearly the same, in spite of the fact that the engine unit weight does not go down proportionately with the size of the bore. And so we can conclude that these two vastly different models, which have nevertheless the same aerodynamic and engine efficiency, would, if they took off together, climb to the same altitude at the same rate of climb, have the same motor run, and glide and land together, thus producing the same duration for equally efficient ships. It is evident that if either had the slightest advantage over the other in design, construction or adjustment, this superiority would appear in the amount of duration achieved.

It would be foolish to claim that in the imaginary case we have considered above, everything would work out exactly as has been supposed. But taking it all in all, it seems reasonable to conclude that neither the large nor the small, nor the light nor the heavy model would be given any advantage. Nor would any of these types be handicapped. Rather, the combination of both aerodynamic and engine qualities would be the deciding factor.

Some preliminary objections were to the effect that large models such as Vernon Boehle's giant fifteen-footer would receive

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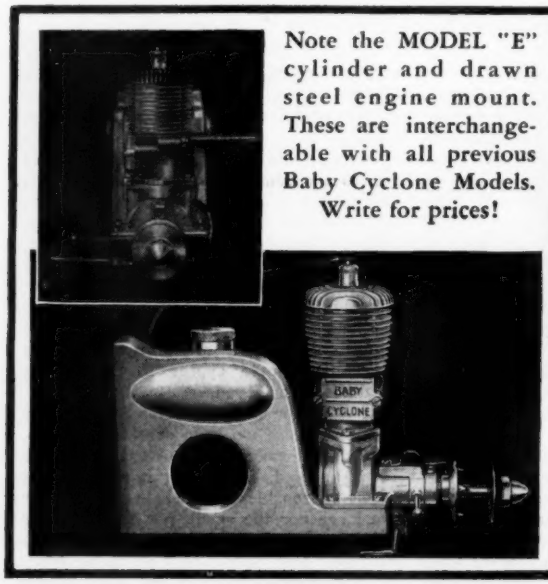

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a "gallon" of gas. This is easily disproven, as it would be eligible, according to the Yates wing area method, for only one and one-sixteenth ounces, which is considerably *less* than the amount it received at the 1936 Nationals. Some also claimed that this idea is a step in the wrong direction, that we should aim to improve engines, and that it will tend to produce extremely large wing area ships of the floating type. Well, as we have already seen, this method will always tend to show which engine is more efficient, and so will directly stimulate manufacturers in this direction. And our example showed that models with large wing area will have absolutely no advantage over small models which have been designed and built with similar efficiency; so there will be no drift to large models from this cause. As far as being a step in the wrong direction is concerned, it has always been the spirit of fair play to choose rules which will benefit all impartially, handicapping none, and permitting no unfair privileges; and surely this rule is in that spirit.

It is worth while to demonstrate one other advantage of the Yates method. The average model in the United States today has about an eight foot span, with nine square feet of area, and weighing around four and one-half pounds. According to the NAA rule, this average model would receive 9/16 of an ounce of gas; according to the Yates rule it would also receive 9/16 of an ounce. So the average model would not be affected either way. But if a model were built a little better than average, perhaps a little lighter with the same strength, the Yates rule would protect this ship by giving it just as much gas as any other ship of the same size, whereas the NAA rule would reduce its amount of gas.

After debating these various points pro and con, one is brought to the conclusion that the method of fuel control which has been discussed here is worthy of the most serious attention of earnest adherents of the game. It should form an excellent basis for the "next step" in furthering the best interests of the gasoline-powered model airplane.

A Vought Fighter That Flies

(Continued from page 23)

cowl and cemented *beneath*. Cement a 1/16" circular bulkhead slightly smaller than the ⅛" rear plate to the rear of the cowl to support the paper cooling flaps which will later be installed. Cement the cowl to the nose of the ship and add the front portions of the machine-gun throughs. Add the cowl block X and scoop after fuselage is covered.

To cover the fuselage use narrow strips of superfine tissue to avoid wrinkles. Spray the finished covering evenly and lightly and give one coat of clear dope.

The canopy is of light sheet celluloid cemented in place. Cut patterns from paper until the desired result is attained.

The cowling flaps are of stiff paper, the subdivisions being painted later with black paint.

Tail Surfaces

The spars of all surfaces are tapered from 1/16" sheet balsa from a width of ⅜" to ⅛". The cross-pieces are cut to the required widths from 1/32" sheet balsa and are cemented in place. The curved edges are of 1/16" sq. bamboo bent to shape around a candle flame. Between the innermost pieces of all the tail surfaces insert 1/32" sheet bracing strips.

To cover use a separate piece of tissue for each side of all surfaces. Attach only the outer edges with thickened dope. Spray the partially completed units and pin to the bench until dry to prevent warping. Dope lightly when dry and cement each in its proper place.

The ⅜" filler sheet portions are inserted between the stabilizer inner cross-pieces and the tail block in such a manner that they agree with the shape of the stabilizer.

Landing Gear

The landing gear structure consists of one heavy, hinged strut to which the 1½" wheel is attached on a .028 wire axle. This wire axle on the real ship is a fork strut. The heavy strut on the model is a metal streamline for the fork on the large V-143.

Make the strut from ¼" sheet, fastening the 1/16" tube hinge in place as directed in the details. Bend the axle to shape and attach to the strut with the wheel already in place. The small piece of tube shown in an internal, vertical position in the strut enables a lock pin to be inserted through another piece of tubing immediately above the strut downward into the strut itself locking it in the flight position. A wire hinge pin runs through the strut tube into the tube on rib K. It is bent slightly to prevent loosening in service.

When retracted the wheels are held up by extending a rubber band from the projection of the axle below one wheel to the same part on the other.

Wings

The wings are made in two panels one left and one right hand each of which fits snugly to the outer center section rib K. The ribs with the exception of the innermost which is 1/16" sheet are all cut in accordance with the patterns given from 1/32" sheet.

The spar being cut from 1/16" sheet is tapered from 5/8" at the root to 1/16" at the tip. The leading edge is likewise tapered but from 5/16" to ⅜" by ⅛" thick. The trailing edge is 3/32" x 3/16" shaped as required. The tips are 1/16" sq. bamboo bent around a candle flame to the desired shape. Note that the first rib of each panel is slanted to allow for the dihedral.

Between the first two ribs of each panel insert three pieces of 1/16" sq. on both the top and bottom surfaces. This is to prevent distortion of the first rib when covered and to aid in maintaining the dihedral.

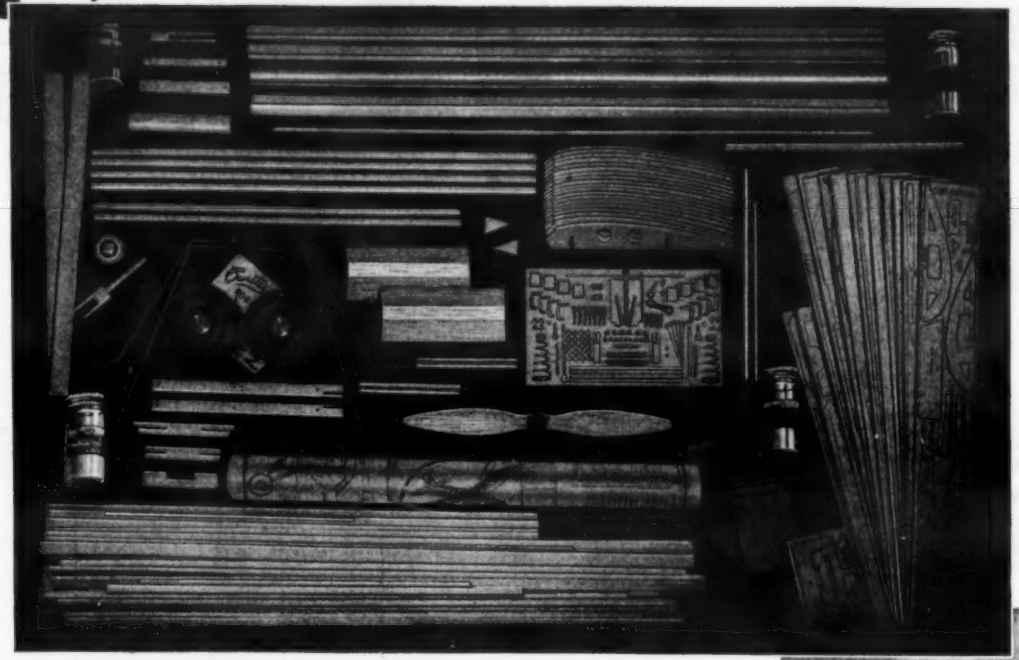
To cover use a separate piece of tissue for each surface of each panel. At first fasten only the outside edges. Spray the partly finished panels and pin to the bench until dry. Dope lightly and cement each in position.

Attach the airspeed indicator at the last rib on the left wing.

Motor and Propeller

The two row crankcase is made by shaping two ½" pieces, one for each row, as seen on the detail. Cement them to-

First—in FLYABILITY!
First—in COMPLETENESS
and FINISHED PARTS!



V Check these FEATURES

DETACHABLE Wings and tail assembly. Wings "give" in event of collision, to protect them. ADJUSTABLE RUDDER and elevator setting. ADJUSTABLE MOTOR SKID accommodates practically every motor on market. Thrust line can be varied. SHOCK-ABSORBING LANDING gear and tail wheel—exclusive with Comet. Prolongs life of model by absorbing landing shocks. Monocoque type, used by newest transports, chosen because of light weight, structural strength, and ease of construction. CURTISS ROBIN chosen because of unusual inherent stability and excellent flyability. MOTOR SKID gives in event of collision—protecting motor. REMOVABLE COWL and hatches for easy accessibility to motor, battery and wing springs.

Specifications

MODEL—Curtiss Robin.
WING SPAN—6 ft.
OVERALL LENGTH—46 in.
WEIGHT OF MODEL—2 lbs. less motor.
POWER—any 1/5th or 1/6th H. P. motor.
WHEELS—3½ in. air wheels.

COMPARE THE CONTENTS

RIBS die-cut, ready to glue in place • LANDING GEAR WIRES bent to exact shape • IGNITION SWITCH • BOOSTER CLIPS • MACHINE SCREWS and nuts, washers, etc. • LANDING GEAR, wing and tail wheel springs • PRINTED ALUMINUM cowl and fire wall • SPECIAL HOOKS and wire fittings all bent to shape • Generous quantities of CEMENT, covering liquid, red and yellow dope • 3 SHEETS BAMBOO PAPER • 2 LARGE PLANS giving all assembly layouts full size, no tracing to complete wing layout • AIRWHEELS • RUBBER-TIRED TAILWHEEL • STREAMLINED STRUTS, leading and trailing edges of wing, completely finished • LEADING EDGES for tail, cowl blocks, etc., ready shaped • MANY PRINTED BALSA SHEETS • SPECIAL BASS BLOCKS drilled, grooved, and slotted, ready to install—landing gear travel block, front, center and rear motor skid supports, tailwheel fork and holder, motor skids, landing gear spreader block • BIRCH PROPELLER blank, outlined, drilled and tapered, ready to carve.

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It took two years of experimenting to produce the Comet Gas Model—but every model builder who has seen it agrees that it was worth while waiting for! It's way ahead of its field in FLYABILITY, COMPLETENESS, FINISHED PARTS, EASE OF CONSTRUCTION, and VALUE! A pleasure to build—and a thrill to fly! Check the features, specifications and contents listed on this page—and compare them with any other Gas Model kit on the market! And remember—the Comet Gas Model really FLIES!

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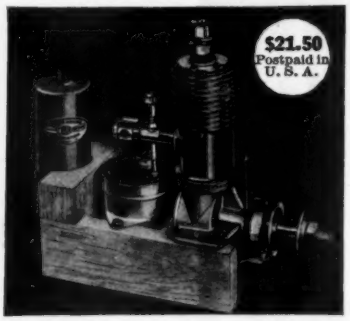
THE 1937 MODEL BROWN JR. MOTOR



For model planes. Length overall 5¾"

New, improved model. Manufactured with the same fine workmanship that has made this motor famous for reliability and for performance.

NEW FEATURES

Improved precision construction designed to give top performance—More compact. Requires less space—Improved gas tank may be cleaned easily—Skids may be removed without disturbing ignition wiring.

Shipped ready to run. See the 1937 model at your model airplane supply dealer's or write us for details.

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BROWN JR MOTOR

gether so that the rear row of cylinders will be staggered. From the front the second row cylinders will be visible between those of the first. The rear cylinders need not be detailed as they are not easily seen when in position. The front of the crankcase is a piece of 5/16" x 1" sq. rounded to fit. The rear square is ⅛" sheet and fits the hole provided in the rear cowling former.

Make two tin bearings and insert one in the crankcase to take up the friction.

Make the three prop blades from 4" x 1¼" x ⅞" blocks. Pin each to the bench and assemble as shown before carving. Strengthen the hub by balsa triangles. Carve in the usual manner rounding the tips after this operation has been completed. To balance point one blade directly down. Lighten the one that descends to balance the third. The blade that was originally pointed down, incidentally this should be the heaviest to facilitate the accomplishment of the task, is then balanced in similar manner against one of the others. Insert the two pronged tin washers in the rear face of the hub and bending the front U of the shaft, insert that part also as required. Slide the crankcase with a friction washer on the shaft and bend the rubber hook.

The power plant is eight strands of ⅛" flat. Form the rubber motor around two pins driven into the bench and work into position by using a long wire hook.

Flying

If possible test the ship over grass to prevent damage in the test stage. Otherwise test R.O.G. on a few turns increasing the winds as the balance is ascertained. A small weight may be used to balance if necessary. The tail may be slightly warped down, for example ⅛", if desired. If the model is ever flown with the wheels up it will be necessary to bend the elevators down even if the ship is in balance.

Bill of Materials

6—1/16" sq. x 36" strip balsa
1—3/32" x 3/16" x 24" strip balsa
1—⅛" x 5/16" x 24" strip balsa
1—1/16" x 3" x 36" sheet balsa
scraps of 3/16" and ⅜" sheet balsa
1—1/32" x 2" x 24" sheet balsa
1—¼" x 3" x 12" sheet balsa
1—⅛" x 3" sq. sheet balsa
3—4" x 1¼" x ⅞" block balsa
1—¾" x 1 5/16" x 6" block balsa
small block scraps
2—½" x 1 1/16" sq. block balsa
1—⅜" sq. x 8" block balsa

Miscellaneous

1—1 oz. cement
1—2 oz. clear dope
8 ft. ⅜" flat rubber
1 ft. .028 music wire
scrap of .014 wire
1—pr. thick 1½" wheels
1—⅝" tail wheel
sheet celluloid
paints or colored dope as needed.

"Gas Lines"

(Continued from page 21)

were judged by acclamation from the crowd. Harold Ball's entry, which won the event, may be seen shown in the background with the cowl up. Frank Bartelli's ship, No. 19, in the middle foreground, placed second.

Picture No. 9 shows Barney Snyder, focal point of the contest. He used an effective public address system to direct the meet. This was one of the features of the contest. The girl whose head is just visible in the corner of the picture handed him the entry blank for each entrant as his ship was flown.

The contest was held on Sunday morning, June 13th, and was by far the largest gas model contest in the history of California gas model aviation. There were 209 contestants who flew, 5000 people witnessed the meet, besides the 700 people who entered and directed the meet. The United States Army sent an official observer, who was immediately pressed into service as a timer.

The early morning fog broke by 7:30 A.M. In its wake were tiny low hanging clouds which produced effective thermals. J. Marsden hooked one of his planes into one of these in short order for the winning flight at 9:00 A.M.

Ted Dykzeul's standard T-D Coupe powered with a Baby Cyclone took second place with a flight of 5 minutes, 19 seconds. Bill Atwood's Special took third place with 5 minutes, 6½ seconds. First prize was $50 and a trophy, second was $20 and a medal and third was $10 and a medal. Beside these 90 prizes were awarded on rather an unusual basis. There was a long table covered with miniature engines, gas model kits, tires, magazine subscriptions and whatnot. Winners were allowed to take their choice in order of their place.

There were few women entries, but almost everyone conceded that Miss Peggy Snyder of Los Angeles stood the best chance of placing. Unfortunately an official stepped on her stabilizer before she had a chance to fly and ruined her chance of winning. Among other entrants was Freddie Bartholomew, the diminutive film star. The arrangement of the meet was designed to meet the peculiar characteristics of the field, to handle the large number of entries and to provide the proper amount of thrills for the spectators. The rules were simple. After a 35 second motor run the duration was taken. A run of 15 seconds or less constituted a delayed flight. Two delayed flights counted as a full flight. The central address system, operated by Barney Snyder of Los

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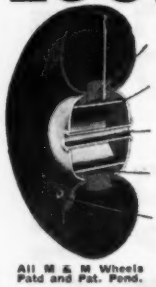

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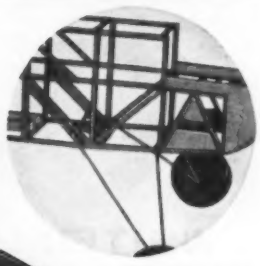
DOUBLE DIHEDRAL OF WING INCREASES FLYING STABILITY

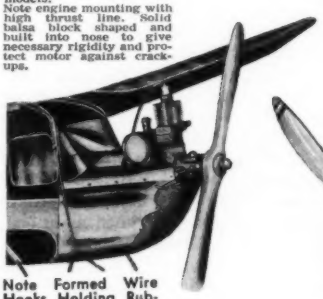
Wing is constructed in three sections—center section and two end sections. Center section frame work constructed of hard, strong Bass wood; ends and tips of Balsa. Dihedral is constructed between center and end, and additional dihedral designed into extreme tips of wing, thus securing the double dihedral which all builders agree is necessary in large models.
Note engine mounting with high thrust line. Solid balsa block shaped and built into nose to give necessary rigidity and protect motor against crackups.

AIR CHIEF



FLEXIBLE SPRING SHOCK-PROOF LANDING GEAR

Severe shock in landing is taken up by special spiral springs anchored inside of fuselage: This permits the landing gear to slide backward, thus eliminating damage. Shocks are softened by these springs; not transmitted to the fuselage.



Note Formed Wire Hooks Holding Rubber Strands Over Wing.

PRIZE WINNING MODEL
by STEPHEN KOWALIK
Winner of Junior Motors Trophy for Consistency in Flight.

This is an exact duplicate of the model which took first place in the I.G.M.A.A. Contest May 9, 1936—average six minutes for each of three flights using 5/16 oz. gas. Nearest competitor averaged three minutes per flight. You can build an exact duplicate of this Trophy Winner.

61" WING SPAN 39" LENGTH WEIGHT—2¼ LBS. (Less Motor)

WHETHER you want a gas model for general sport flying in your own way, or for keen competition against all comers—this is the model you should have! This is a reliable, consistent flyer which can be powered with any standard engine, and will give you the thrills which come only with powered flight. At the same time it will hold its own in official contests. Is easy to build and has many exclusive IDEAL features found in no other model. Read the following list and compare this gas model with all others—then you will decide this is a model you want!

THESE DISTINCTIVE FEATURES MAKE THIS MODEL THE BEST BUY OF THE YEAR!

Double Dihedral Built into Wing Increases Flight Stability and Rate of Climb
Bass Wood Fuselage Framework Gives Greater Strength
Special Bass Wood Center Wing Section Adds Strength Where Most Required
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3½" Pneumatic Air Wheels. Screws and Nails Included.
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Plans Include Patterns for Both Halves of Wing.
Special Landing Gear Struts (3/32") Fully Formed, Threaded and Complete with Nuts
Special Shock Absorbing Spring Landing Gear Mounted Inside Fuselage.
Wire Hooks for Holding Wing Anchoring Rubber Supplied Ready Formed—Rigid Yet Flexible.
Wing and Tail Assembly Detachable for Transportation.
Removable Metal Cowl Permits Easy Accessibility to Motor and Connections.

Kit contains all necessary hardware, rubber strands, gas model cement, bamboo covering paper, etc., 2 large sheets of Full Size Pattern-Plans with detailed instructions for building the entire model, so easy anyone can follow them. Price.....

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¾" Size, per 6" Pce.	.14	.21
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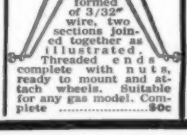
Most convenient holder for round flashlight batteries, 6 in. long, 1½ in. diameter; metal screw caps on ends with terminal fittings for connecting wires securely soldered in place. Coil spring included for inside of case. Weight 2½ oz. Each 35c. Postage 5c extra.

LANDING GEAR STRUTS



Threaded ends complete with nuts, ready to mount and attach wheels. Suitable for any gas model. Complete 90c

Angeles, formed an unusual and efficient system of communication. This system was kept in touch with the center of the field by telephone at all times. The announcer, upon being informed that a ship with a certain number was being warmed up, would obtain the registration card of the contestant and tell the spectators all about the ship and the highlights about the contestant himself. Usually the Southern California Association holds their contests on a precision basis. However they decided against this system because of the 200 airplanes entered and of the consequent difficulties of running off a precision contest.

The Association has its own private field which is used exclusively for gas model operation. Five cents is charged for spectators and the Association "cuts in" on the refreshment concession. Proceeds go for the running of the field and club expenses. Officers are:

Tom Trulson, president; Earl Harpe, secretary-treasurer. Work-horses of the contest were F. B. Knapton, who spent two months in lining up entrants, advertising for the program, and finally in seeing that everything went according to schedule, E. Fletcher and Peggy Snyder. The P.A. system's announcer was Barney Snyder, of Modelcraft, Los Angeles model supply house.

The most significant feature of the contest was the complete failure of anything but a standard, high-wing design of moderate proportions to place among the winners or get any kind of recognition. Large "power gliders" were unable to cope with the performances of the ships which were bringing in the better scores because of rapid climbing ability and finer soaring ability due to their aerodynamic efficiency. It is the Association's goal to stage contests in which all landings will be made on the field. This practice is to be highly commended, for under such a form of operation there can be no adverse criticism by those who are making unwarranted trouble for gas model fans.

It appears that one of our record holding rubber model enthusiasts has gone gas model. He is William Ying of 1561 Beach Avenue, New York City. Sometime ago he expressed his desire to build a gas model to the editor of MODEL AIRPLANE NEWS. Since then he has been busily engaged in doing a fine piece of work, the result of which is shown in picture No. 10. It is Ying's uncovered gas-powered ship of ten foot span. Possibly some readers will see the influence of the KG in the design of the plane. Since the picture was taken Ying has test flown his ship and he tells us that it performs to perfection, having a beautiful take off, a good climb and a very flat glide. As might be expected it is unusually

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JAPANESE TISSUE
Brilliant
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stable. Unfortunately the ship collided with a telegraph pole and its nose was damaged. However it was repaired in time to be taken to the Nationals.

Some fine work is being done by the Scripps-Howard Junior Aviators gas model section. Mr. Charles Tracy. aviation editor of the Toledo "News-Bee" has been unusually active in this field. He is an ardent rooter for gas models and has been kind enough to send us several pictures of a contest held on May 9th. Picture No. 11 shows Michael Roll of Detroit, Michigan, with his plane which won the contest.

Picture No. 12 shows one of the eight foot, eight inch jobs which was entered. It has a Brown motor in the nose and has made 61 flights to date, the longest one of approximately 55 minutes.

Picture No. 13 shows a group of fliers in Iowa who make regular weekly flights at their flying field. Left to right the ships belong to: Milton Myers, Charles Failes, Theodore Everett, Mike Smith, Dave Smith. Everett does not show in the picture because he is behind the camera.

Radio Station KCMO of Kansas City is sponsoring a chapter of the I.G.M.A.A. The first meeting was held on July 13th at the KCMO studios. Those who would like to join this chapter should call Mr. Claude Arrasmith at Highland 5465 or write him at 5347 Euclid Avenue, Kansas City, Missouri.

William Berry of 951 East Price Street, Philadelphia, Pa., leader of Unit No. 15 writes and tells us that his unit, Unit No. 6 and Unit No. 64, held a contest on May 8th. The gas allowance was cut to 1/28 once per pound of weight due to the difficulty experienced in keeping models in sight. A second meet was held on June 5th which was unofficial. This was indeed unfortunate because in this event a flight of 24 minutes, 20 seconds was made. This exceeds Maxwell Bassett's record flight of 23 minutes, 18 seconds. If the flight had been official the I.G.M.A.A. trophy would have been given to the new winner, Ray Landis.

Mr. Edward J. Brounk of 1331 South 15th Place, Milwaukee, Wisconsin, head of Unit No. 27, says that they held a contest on June 27th. He asks us to insert this notice in MODEL AIRPLANE NEWS so that people might attend the meet. However he evidently did not realize that in order to insert a notice in the magazine that will appear before any event, such a notice must reach this office at least two months ahead of the date of the magazine. We are anxiously awaiting the results of this meet.

Bob Hamfeldt, secretary-treasurer of Unit No. 82, of 648 James Street, Utica, New York, says that in a recent New York State Exchange Model Airplane Meet they took second and fourth places in the gas model event. One unfortunate incident happened to the club president, Mike Hoyer, when his Quaker smashed into a brick building and broke off the cylinder of his Baby Cyclone. However he has another ship to take its place.

Mr. Karl N. McMullen of 2530 North 75th Street, Omaha, Nebraska, director of the three Nebraska units, tells us that they have a contest planned for September 6th. Model fans in this district should get in touch with Mr. McMullen if they desire to enter.

Mr. J. C. Fox of 725 Bush Street, San Francisco, California, leader of Unit No. 49, the Gas Model Association of Northern California, suggests that winners in various unit contests compete together in some national event. This is a very good suggestion and thought will be given the subject.

A state-wide contest was held at Kelly Field, Texas, on June 6th. Mr. Ralph Pressler, secretary of the San Antonio Society of Model Engineers, 825 Avenue B, San Antonio, Texas, sends us information concerning the contest. The meet was sponsored by the Society. Approximately 4000 people attended. Unfortunately the day dawned with heavy clouds and a gusty wind of 23 miles per hour blowing. Raymond Santee of the 53rd Squadron, Randolph Field, Texas, got one good flight and the wind carried the model out of sight in 3 minutes, 56 seconds. This flight took fifth place. From the time of this flight until 5:45 P.M. every model that got into the air was smashed in some manner by the wind in landing. This was very unfortunate for the spectators as well as the boys and gave the impression that one flight is all a gas job can make. Ships were entered from Fort Worth, San Antonio, Houston, Dallas and Corpus Christi, totalling 25.

One of the features of the contest was the splendid cooperation and help received from the Army personnel of the field. It rather looks as if the gas model fans have the Army back of them, at least. We would say that this is a very good sign. Mr. Pressler writes that they did an excellent job in taking care of the various functions at the contest. He wishes to acknowledge his indebtedness to Colonel A. N. Grogstad, commandant of the field and Sergeant John Llewellyn in particular. The Society was given an invitation by those in charge of the field that they might hold other contests there in the future. Guest model flying takes place every Sunday morning from 9 A.M. to 1:30 P.M.

Comments from Readers

We hear from N. Kasmer of the Model Airplane Associates of Rochester of 892 Clinton Avenue South, Rochester, New York, concerning the recent attacks on gas models. He says that at their contests the first problem has been people; that is, interested spectators. He says:

"We fly our models on a city golf course, which happens to have a very large area in one place in which the golfers do not cross but go around. A picnic ground is on the very edge and we are always sure of from 50 to 200 people present, especially on a Sunday."

He says, further, that planes have run into several people as it has been impossible to keep the crowds away from the take offs and landings. To overcome this situation the contestants have been instructed to caution the spectators to stay back.

We wish to comment on Mr. Kasmer's practice of flying gas models under such conditions. We feel that the manner in which he has been carrying on his flights does not contribute to the success of the gas model game. Obviously it is wrong to fly models at a place where people have to be cautioned to keep out of their way. In fact

it is up to the gas model fan to fly at such a place where the spectator will not have to be cautioned to keep out of the way. Such a practice is not in keeping with I.G.M.A.A. standards. We feel that better judgment might be used to make gas model flying more immune to criticism.

It appears that, after all, there is nothing the matter with gas model flying but often there is something wrong with those who fly them.

Regular flying rules will be published shortly which will govern the activities of all I.G.M.A.A. members. These rules will be written in order to take care of such situations that have just been presented. Those who break these rules will be requested to resign from the Association.

We take pleasure in printing an article by Mr. Robert K. Allen of 7041 Frankstown Avenue, Pittsburgh, Pa., who is I.G.M.A.A. state director in Pennsylvania. It is as follows:

Shall We Fly Gasoline Powered Model Airplanes?

The present campaign to stamp out the clean and educational sport of building and flying gasoline-powered model airplanes is an insult to the intelligence of the air-minded youth of America. The purpose of the campaign is veiled by an effort of those directing it to focus your attention on the so-called dangers of this activity and AWAY from their own LIMITED activities. We ask you to be fair and square. Give both sides your attention, and then choose the course which you see fit to follow. Look at the record of the Governing body controlling gas model activity. This is clean and with no marks of poor management against it. For your information we offer the following:

1st. All models powered by gasoline motors that are under our jurisdiction are registered at headquarters by size, type, and motor number. This was instituted in order to enable the directors to more intelligently administer the policies of the organization. It identifies each model with a certain person and any irregularities may be traced to the boy or young man responsible. When this is done, any adjustments that may be necessary are speedily completed. (We think that this alone is justification for our existence.)

2nd. The Director of the Gasoline Powered Plane Organization with Headquarters in New York City is looked to by all of its members, whether advanced or novice, for advice in flying and constructing their models. His advice is invariably correct and in this respect has a great bearing on the safe usage of the ships. He is the outstanding authority in the United States on model airplanes.

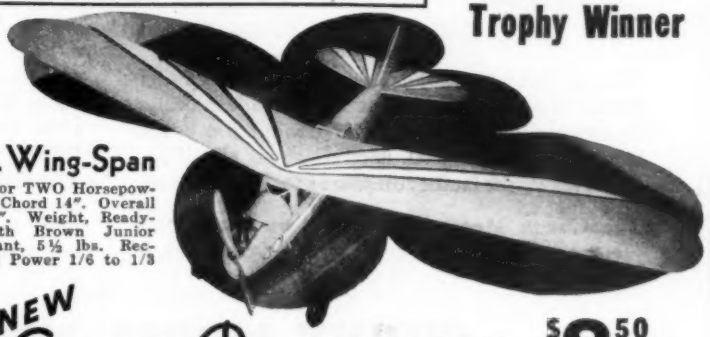
3rd. The Directors of the hundreds of Unit-groups throughout the country have made arrangements with a local airport in their immediate vicinities to fly and test these models. This in itself is evidence enough in direct disagreement to published newspaper editorials in which was stated that these Gas Powered Models are a hazard to man-carrying airplanes. The various managers of these airports have, with few exceptions, given their full support to our organization.

4th. Civic organizations such as the

America's No. 1 Gas Model

CONGRATULATIONS: To Fiske Hanley, Fort Worth dealer for Berkeley Model Supplies and the 1937 Texaco Trophy Winner. Congratulations also to the 26 other Berkeley customers who were prize winners in the gas model events at the 1937 Nationals.

DuPont Trophy Winner



7½ ft. Wing-Span

Stressed for TWO Horsepower. Wing Chord 14". Overall length 59". Weight, Ready-to-fly with Brown Junior Power Plant, 5½ lbs. Recommended Power 1/6 to 1/3 h.p.

THE NEW "Super-Buccaneer" $8.50 UP

Winner of More Places at the 1937 Nationals Than All Other Commercially Designed Models Combined!

No model can meet the record of the Buccaneer Designs. Buccaneers have won prizes in more contests, held in different places and flown by different model builders than any other advertised designs.

An example of its consistent winning is the Toronto-Eaton Contest at which it won 1st, 2nd, and 4th place. At the Detroit 1937 Nationals it won the coveted bronze DuPont Trophy for all-round performance, three cash awards, and a medal! Remember, these models were, for the most part, flown by average model builders who had chosen the Buccaneer design for their first gas model!

Yes sir, it is just the model you want for yourself. Its streamlined beauty is incomparable. Exclusive construction makes it practically crack-up proof. The Chicago Parks District have chosen this design for their beginner's class in gas models because of its ease of construction and flyability.

SPECIAL Complete plans for the "Buccaneer," full size, four big sheets with complete instructions and bill of materials. Over 30 square feet of accurate detailed drawings. Worth double our price. **$1.50 P.P.**

COMPLETE KIT—Including EVERYTHING to build the model except power plant and wheels. Kit includes:—Ribs and bulkheads printed on wood, all wood specially selected and accurately cut; pint cans of cement and colored dope; tubes of cement for covering; wire for landing gear; wood for motor mount and battery box; toggle switch; aircraft ignition cable; bamboo paper; full size plans and instructions.

$8.50 POSTPAID IN U. S. A.

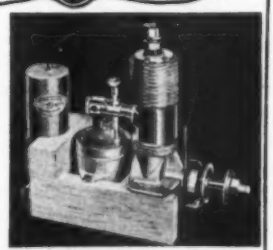
Complete Kit (as above) including 4½" M. & M. Wheels **SPECIAL REDUCED PRICE—$10.95 Postpaid in U.S.A.** Complete Kit (as above) including Brown Jr. Motor, M & M Wheels, and special design laminated propeller—Special Combination Price—$31.50. **Postpaid in U.S.A.** Complete Model Ready-to-Fly:—Test hopped, with full instructions. Custom built to order.

$125.00 crated. F. O. B. Brooklyn, N. Y.

DISTRIBUTORS OF THE NEW IMPROVED BROWN JR MOTOR

Complete $21.50 Postpaid

NO EXTRAS TO BUY



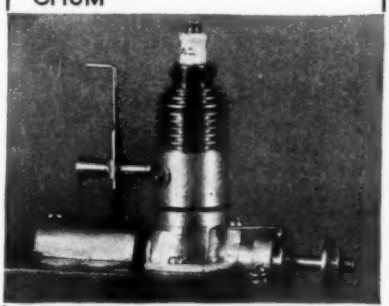
FREE For a limited time only. A 14" Laminated propeller with every purchase of a new Brown Jr. Motor.

NEW TYPE FUEL TANK

Can be taken apart and cleaned. Feeds at high angles of climb. **$1.50 P.P.**

We will accept your old motor in trade, regardless of condition or make. Write to us for details, stating make and model of your old engine. Up to $15.00 allowance on old Brown Junior Motors!

New 3½ oz. Motor Ready for Immediate Delivery—The CHUNN "CHUM"



$17.75 P.P. COMPLETE—READY TO RUN FOR 3 to 5-FOOT WINGSPAN MODELS

⅝" Bore—17/32" Stroke

Rated at 1/10 h.p.

The "Chum" is the easy starting little motor that made nearly one hundred demonstration flights at the Nationals. It delivers sufficient power to fly models up to two pounds in weight, and is the only engine of its size available for immediate delivery.

Price includes engine, tank, coil, and a Brown Jr. Spark Plug. Every engine is inspected, tested, and certified by Berkeley Model Supplies.

REDUCED PRICES ON WHEELS!!

M. & M. 3½" & 4½"	Dia.	$2.75	pr. p.p.
OHLSSON 3½"	Dia.	1.50	pr. p.p.
OHLSSON 4½"	Dia.	1.75	pr. p.p.

BERKELEY *Gas Model* PROPELLERS

13" dia. Mahogany, varnished, $1.00 ea. p.p.;
14" dia. Mahogany, varnished, $1.10 ea. p.p.;
16" dia. Hickory, $1.50 ea. p.p.

13" dia. Laminated Spruce and Mahogany, varnished, $1.35 ea. p.p.

14" dia. Laminated Spruce and Mahogany, varnished, $1.35 ea. p.p.

14" dia. Left-Hand Laminated Spruce and Mahogany, varnished, $1.50 ea. p.p.

M. & M.—OHLSSON WHEELS (Gas Model)

3½" dia. M & M	$1.50	pr. p. p.
3½" dia. M & M	2.50	pr. p. p.
4½" dia. M & M	3.75	pr. p. p.
3½" dia. Ohlsson	2.75	pr. p. p.
4½" dia. Ohlsson	3.00	pr. p. p.

NEW!! "PEARLENE" DOPE

A new metallic finish dope that will add 100% to the looks of your gas model. Specially formulated for model airplanes, it is lightweight and can be easily brushed on.

In five beautiful colors: Gun Metal—Red—Green—Blue—Bronze.

Pint ..... 85c P.P.
Quart ..... $1.35 P.P.

BERKELEY MODEL SUPPLIES

"FIRST IN GAS MODELS"

53 BERKELEY PLACE Dept. U-29 BROOKLYN, N. Y.

Chunn Model Motors, Inc., *Announce*

Regular daily production on the Chunn Model Motor. Deliveries assured

We are glad to announce that the Chunn Model Motor is now being produced in a modern, fully-equipped factory on a regular production basis. Deliveries are assured. Each motor is tested before it leaves the factory on same block as shipped.

The Chunn Motor weighs 3½ oz. bare; complete motor, coil, condenser and gas tank weigh 6½ oz. It develops approximately 1/8 H.P. at 4500 R.P.M., turns an 11-inch propeller of 6-inch pitch at 3500 R.P.M., and has a speed range from 500 to 8,000 R.P.M.

The Chunn Motor has ample power for model planes of 3 to 6-foot wing-spread. It is precision-built throughout, and only the finest materials are used.

Price, $17.50 prepaid. Dealer inquiries solicited.

CHUNN MODEL MOTORS, Inc.

804 ACKLEN AVE. — NASHVILLE, TENN.

American Legion and business houses led by the largest department stores of the country have been more than active in assisting us to maintain a reputable and reliable policy of administration of gasoline-powered plane activities in the United States.

5th. The Gas Model Airplane Association is *functioning for builders* and *is not attempting to have builders perform for it.* The association is non-profit, the only charge being for the pin, which is sold at absolute cost to the members of the organization. All contests may be entered by a member without a fee of any kind and each contest is sanctioned by the highest aviation body in the world, The National Aeronautic Association. This approval we value highly, and we are attempting to make the hobby of building and flying these gasoline-powered planes a sport for the enjoyment of everyone.

Mr. Pat Sweeney of 4508 Broadway, Chicago, Illinois, president of the Central Gas Modelplane Society, makes some interesting comments in a letter which he has sent to leading personalities in the gas model field. We quote from his letter:

"After flying gas models at one of the busiest airports in this section of the country, nothing has happened that would be detrimental to the interests of gas model building or to the community. On the contrary, airline pilots, airways observers, mechanics, airline executives, men who are making aviation their career and livelihood, are counted among the thousands of aviation enthusiasts, WHO ARE SINCERELY INTERESTED IN THE WELFARE OF AMERICAN AVIATION, and who are participating in this genuinely fascinating and highly educational hobby that has already taken the nation by storm. Certainly these men, who make their livelihood in aviation CAN'T BE WRONG! If the pioneers of modern transportation had entertained such pessimism as this, we would no doubt still be in the era of covered wagons.

"In closing we wonder why they do not think it is dangerous to send thousands of youngsters to amusement parks that feature hazardous rides which take their annual toll of patrons' lives every summer. Perhaps they would recommend that they have their eyes blown out with lead moulding sets, or that they should disfigure themselves by playing with dangerous acids, endanger their lives by playing ball in the streets, or riding bicycles."

Mr. S. Kramer of the Burd Model Airplane Company of 101 West Pratt Street, Baltimore, Maryland, has become very incensed, as have thousands of other people, over the attempted ban on gas models. He writes:

"We took the trouble to communicate with the Fire Underwriters Association of Baltimore in respect to a particular reference to the banning of building and flying gas models in Baltimore City. Quoting from our reply, it was in short, 'We have adopted no regulations as yet on this subject, concerning which, at this time, we have little or no information.'

"Will we permit this campaign to take root and foster? Will we permit this necessary link between the flying of rubber-powered models and the real planes to be taken away from us? Will we permit the most practical step as yet developed for experimentation in design to be so carelessly down-trodden? Why not combat this propaganda NOW, before it takes too firm a hold in the minds of the readers?"

Mr. A. B. Fruchey of 448 Center Street, Findlay, Ohio, writes and sends us a very interesting letter in answer to those who wish to prohibit gas model flights. It is as follows:

"I received your circular in regard to the so-called safety campaign to ban gas models. If it was not for the fact that a publicity stunt of this kind could do a great injury to model building the charges trumped up by this organization would be too silly to warrant further consideration.

"One charge in particular burns me up. The one regarding the laws governing personal rights and property. The men and boys who have the patience, neatness and ingenuity needed to make a worthwhile model builder are not the type who would disregard the laws of safety. I have been in close contact with model builders for the past five years and I have always found them to be the kind of fellows their parents hoped they would be. Honest and honorable. Nowhere can you find a greater display of sportsmanship than that shown at a model meet.

"A charge of this kind is a direct insult to every real model builder in the country.

"The element of danger at a supervised model meet is nil. I would suggest that they try one supervised meet in order to convince themselves. From reports I don't believe they ever tried this.

"Now I want to give you the opinion of a crack pilot and airport manager, none other than the ace of acrobatic fliers, Lieut. James C. Mackey. You may have seen or met Joe at one of the many air meets held in the east last fall. If not let me introduce you. Joe is manager of the Findlay Municipal Airport and heads a great outfit of aerial advertisers. He represented the United States at the International Air Show held in Paris, May 17, 1936. He won the Freddy Lund Trophy for acrobatics at the Miami Air Races on December 19, 1936 and is at present leading his troup of A-1 pilots through a series of the fastest moving air shows ever to be witnessed in the middle west. He's a real artist and a great guy. He is 100% for the model builders and will go to bat for them every time. When a model builder needs a friend, hunt up Joe.

"He has always cooperated with us in every way; offered us the use of the field at any time, given us the hangar for a workshop and put up airplane rides for contest prizes. He gave talks at our club meetings and did a million and one other things that make the model builders of this section thank the lucky day that sent Joe to Findlay. I turned your circular over to him and asked him for his honest opinion as a pilot and airport manager. You will find his opinion in the following letter. The model builders of Findlay, including myself, will cooperate in every way possible

to stamp out this harmful propaganda."

Lieut. J. C. Mackey's letter follows:

"I have just completed reading the article by Charles H. Grant concerning the possibility of regulations prohibiting the flying of gas models. The arguments used against such flights are obviously absurd and it seems almost beyond comprehension that anyone could be so narrow minded and have such a complete lack of knowledge of the ratio between the infinitesimal possibility of damage to persons or property as against the invaluable advantages to the youth of our nation as well as the future benefits to be derived by the aviation industry. As long as I am manager of this airport or any other you may rest assured of my complete cooperation along the lines of the promotion of gas model flying on that property over which I have control."

It has been inferred by enemies of gas model planes that the Elmira Gas Model Meet was banned because of dangers that might be involved in holding it. We are happy to say that this is not a fact. The Elmira meet was postponed because of a conflict with the dates on which the Nationals were to be held. It was finally arranged that the events and prizes which were to characterize the Elmira meet were to be held and given at the National contest.

We hope everyone will do their part in combatting any menace to the broad education of young Americans in aviation through the medium of gas model planes.

A Precision Contest Gas Job

(Continued from page 16)

strength where tail surfaces are attached. This will complete the side frames of the fuselage, and now it is possible to build the two frames together as shown in the top view. Again, in completing the bending operation at the nose, caution should be used, and it is probable that the ¼" sq. longerons at this point will have to be steamed to obtain the correct curve.

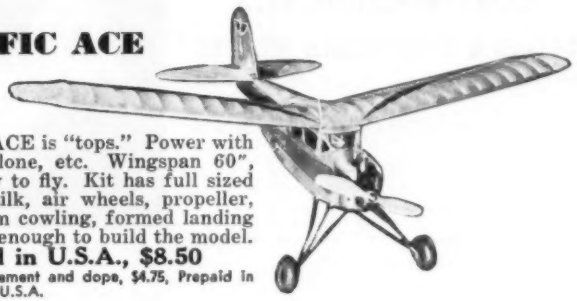
Now that the bare fuselage is completed, including all diagonal bracing, install diagonal bracing internally at each vertical member station, from the rear of the cabin to the start of the solid balsa panels in rear end. This insures a very rigid fuselage. Be sure to install them from one corner to another in alternate fashion. Avoid having the whole series of these internal 3/16" sq. balsa braces running in the same direction. Put in the rear motor beam anchorage bulkhead, which is shown on Plate 3. Carve the solid balsa section (over the windshield) from medium balsa. Install it, with a section removed from lower rear corner, against the ends of the upper longerons and the cross brace which has been previously cemented at this point. Permanent rigid bracing of the balsa block will be possible only after the 1/16" alum. tubing braces have been installed, when the nose formers are in place. The dotted lines around the edge of cabin windows and windshield indicate the single pieces or celluloid which are installed later, flush with fuselage surface, so that when fuselage is covered, they are perfectly flush with the surface.

In installing the wing panel fittings in fuselage, run 3/32" O.D. alum. tubing across fuselage, leaving ends projecting slightly on each side, so they may be spread with a center punch after passing through the square aluminum pieces which are cemented in position flush with the fuselage sides. Use cement freely in this installation. The tail post of the fuselage should now be cut to correct shape and installed, after first drilling three holes through it to obtain negative adjustment on the stabilizer. (This model should not require any positive setting, but if such is needed, the holes in the front metal fittings on stabilizer can be elongated with a file.) The aluminum plates which are installed on each side of the tail post are cemented in position flush, matching the holes drilled through the balsa. The aluminum tubing going through the fuselage for the stabilizer pins is ⅛" O.D. Each length is riveted over the small aluminum plates in the same manner as the wing panel fittings in the forward end of the fuselage. Before the sheet balsa filler on top of fuselage is cemented in place (section under fin) cut out and install an internal piece of ⅛" sheet stock also, which supports the lower ends of the ⅜" O.D. aluminum tubing into which the fin pins slide. Drill it with two ⅜" holes first, in proper positions. Now the top filler can be installed permanently, after first drilling it for the tubing. Cut two sections of the ⅜" O.D. aluminum tubing and install them, cementing securely at each joint with the balsa.

Before proceeding with building up the nose, the landing gear must be installed.

A GAS JOB OF DISTINCTION

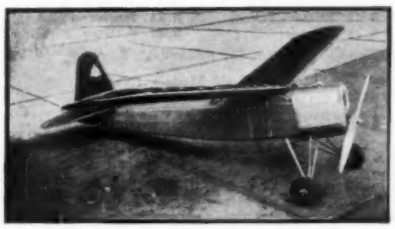
THE PACIFIC ACE



Beauty, performance, ease of construction or dollar for dollar value, the ACE is "tops." Power with Ohlsson, Brown, Cyclone, etc. Wingspan 60", weight 3¼ lbs. ready to fly. Kit has full sized plans, cut-out ribs, silk, air wheels, propeller, switch wire, aluminum cowling, formed landing gear, etc. More than enough to build the model.

Price Prepaid in U.S.A., $8.50

Same Kit less wheels, silk, cement and dope, $4.75, Prepaid in U.S.A.



THE SCOUT May be built as a 48", 54" or 60" High Wing or a 60" Low Wing. A good rough weather ship, designed for the smaller engines such as Cyclone, Tom Thumb, Midget, Precision, etc. Kit has full sized plans, cut-out ribs, wire, switch, cement, dope, silk, air wheels, formed landing gear, etc. **$7.25** prepaid in U.S.A. Special cowl (see photo) not in kit, $1.00 extra if purchased with kit.

Same kit with Whitfield's bamboo paper and rubber "do nut" wheel **$4.85** prepaid in U.S.A.

Same kit less wheels, covering cement and dope $3.75 prepaid in U.S.A.

ENGINES

Syncro Ace Engine ⅛ H.P.	$15.00
Ohlsson Engine ⅛ H.P.	18.50
Long Life Battery	.80
Light weight switch	.20
Condensers	.20

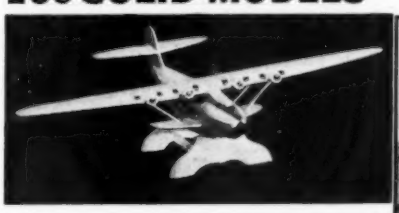
SUPPLIES

4½" Streamlined Air wheel	$1.75
3½" Streamlined Air wheel	1.50
Rubber Tail Wheels 1", 1½", 1¾" Each	.10
Coils "Smith"	2.50
Timers "Auto Knip"	1.75
Timers "Smith"	3.00

PROPELLERS

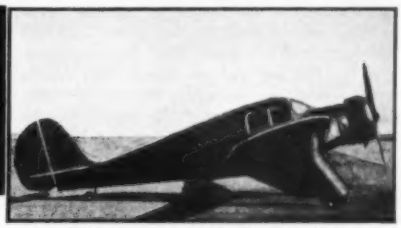
3 guard, 12", 13", 13½", 14" **69c**

10c SOLID MODELS



6" to 7½" Wing spans. Hawk, Spad, Fokker D7, Boeing P26, Grumman Fighter, Caudron Renault, China Clipper, Mr. Mulligan, Waco C, Kinner Envoy, Northrop Gamma, Douglas Transport, Gee Bee, Goshawk, Boeing P12, Boeing F7-B1, Wedell Williams, Stinson Reliant. Add 5c postage for each 3 kits.

40" FLYING MODELS



Aeronca Low wing (pictured) and Rearwin Speedster

Kit 50c plus 10c postage

DEALERS: *Liberal discount on kits, engines and supplies. Write on letter head.*

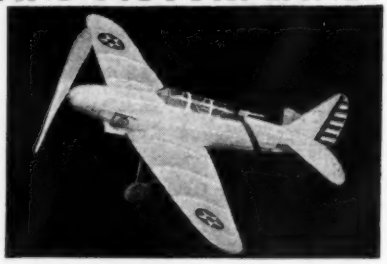
THE LEADING SUPPLY HOUSE OF THE WEST **MODELCRAFT** 2125 W. 54th St. Los Angeles, Calif.

FLY-A-WAY GLIDERS AND MOTORPLANES

CONSTRUCTION SETS

FLYING & SHELF SCALE MODELS

All kits complete — No extras to buy



24" Flying Model Construction Sets

181	Mr. Mulligan	191	Kinner Envoy 27½"
182	Kinner Sportster	192	Rearwin 29"
183	Ryan Sportster	193	Stinson SR 8C-29"
184	Seversky Sev. 3L	194	Bellanca 29"
185	Consolidated P 30	195	Aeronca C3 29"
186	Fairchild Warner 22	196	DeWoitine 29"

2 sets 60c Postpaid U. S. A.

16" Flying Model Construction Sets

F 38	Art Chester Racer	F 44	Brown B3
F 39	Curtiss Coupe	F 45	Aeroneer
F 40	Vultee V-11	F 46	English Puss Moth
F 41	Fairchild 24	F 47	Fokker D 8
F 42	Curtiss Falcon	F 48	Polish Fighter
F 43	Boeing F4 B4	F 49	Spad

2 sets 35c Postpaid U. S. A.

If your dealer cannot supply you, order direct.

8" Shelf Model Construction Sets

N 38	Art Chester Racer	N 44	China Clipper
N 39	Vultee V-11	N 45	Hughes Northrup
N 40	Fiat	N 46	Brown Special
N 41	Lockheed Electra	N 47	Northrup Attack
N 42	Stinson Reliant	N 48	Hawker Fighter
N 43	Aeroneer	N 49	Seversky Pursuit

2 sets 35c Postpaid U. S. A.

12" Shelf Models (New)

No. 60 China Clipper	A4 Sikorsky S42
A2 Douglas Transport DST	A5 De H "Comet"
A3 Martin Bomber	A6 Douglas Observation

35c each Postpaid U.S.A.

PAUL K. GUILLOW — WAKEFIELD, MASS.

Be sure that the ¼" x ½" cross braces under fuselage frame, upon which the wire members of the landing gear are mounted, are installed very securely, and it is suggested that pins be run in for additional strength. Install the corner braces cut from sheet balsa, only after the wire has been installed on cross beams and securely bound with very heavy thread. Use the metallic cement here very generously; if it is done correctly, there is no reason for it to ever jar loose. The landing gear itself consists of three ⅛" piano wire frames, formed first to the correct spread and length. The front, side landing gear wire is the one which forms the axles. After installing on cross beams, connect the two side frames and the center shock-absorbing member together at the bottom, using small copper wire to bind the two joints together. Solder these well, allowing the flow of solder to form a good union. The balsa landing gear ribs will be presented in the second installment, as it is not necessary to put them in just yet.

Cut out the nose formers and install them at the correct locations. At this time the formers used on the removable hatch on top of fuselage should also be cut and installed. Now procure some hard balsa stringer stock, size 1/16" x ⅛". The nose has quite a number of stringers, but these enhance the appearance greatly in this vicinity. As will be observed by looking at the assembly drawing, the completed stringer installation blends from a perfect circle at firewall out to almost square form at their termination point.

The firewall should now be made. It is shown full size on Plate 2 and is circular in form, being the same diameter as the engine cowl, 4¾". It should be formed from medium hard balsa having a thickness of ¾". The rectangular motor beam holes are cut out by drilling with a 3/16" drill in the sections to be removed and using a coarse file or sandpaper on narrow block to procure the correct size and shape holes. Prepare the other necessary holes and the three studs upon which the cowl support rods are hung. Use 4-36 brass machine screws for these studs and get the correct length by cutting them off if necessary. Each should project ¼" after sinking and cementing flush, from the rear side of the firewall. See assembly drawing for correct curving on edge of firewall. Cut four 3/16" aluminum tubing spacers and cement to firewall, near edge, as shown. The firewall may now be cemented to nose former N-1. Use an ample quantity of cement in attaching it securely. Now that the nose stringer installation is completed, the 1/16" aluminum tubing bracing can be installed between the top section of former N-3 and the solid balsa block over windshield.

In making the engine mounting beams, use high grade wood only, as a lot depends on this material. The writer feels that hardwood beams are far superior to a metal motor mounting, from personal observation. A metal mounting can only bend and collapse while the hardwood beam type absorbs all sudden shocks to which it may be subjected, provided it has the required "spring" in it. Black walnut makes an ideal mounting material, having the required "spring" and being a tough, hard-to-split wood. Maple also is excellent. Cut two pieces, size 3/16" x 15/16" x 7¾". In installing them, use metallic cement and make sure that all joints are very solid. Drill all holes necessary for metal mounting plates before installing the wooden beams in fuselage.

Use 1/16" sheet balsa for making the cabin floor and the vertical bulkhead which is installed at the rear end of the cabin. It is not necessary to cover the sides of the cabin interior unless desired. The motor mount bulkhead MM forms the enclosure for the front end of the cabin.

The stringers on the main part of the fuselage should now be made. They are cut from 1/16" sheet balsa and must have a curve as shown on assembly drawing. The top of the fuselage has five stringers, while the sides and bottom have three, respectively. The top stringer on each side of the fuselage is terminated where the tail surfaces begin, when in place, as shown. Soft balsa is sufficient for this fairing work. Now that the fuselage is practically completed, the removable hatch over the cabin should be constructed. Formers F-1 and F-2 are at each end, and ⅛" sq. balsa bracing is installed diagonally. Dress snaps are installed with cement flush with the surfaces. The switch and booster socket panel, as described on Plate 3, is installed where indicated on drawing. Any electrical supply or department store can supply a small "button" switch. It will be necessary to paint two sections on opposite sides of the revolving button, to show when switch is on or off. This switch is obtainable at a nominal price and is small in size, insuring a neat switch installation. So many gas jobs are spoiled by using a cumbersome, large toggle or throw switch, when a "button" type could be used just as readily. The wiring of the ship and the battery box detail will be discussed in the next installment.

The flight timer and timer switch installation should prove self-explanatory. See Plates 1 and 2 for this detail. This timer is obtainable from the same concern which manufactures the engine used in this model.

The tail wheel unit is a simple fork of 1/16" piano wire which pivots on a piano wire cross-arm, installed across the two lower longerons at the point shown. A spring is now fastened to the tail wheel fork and secured a little to the rear, in the fuselage, at the other end. Be sure spring is of right type. It should be fairly stiff in action.

The cabin windows are put in later. The original model has its cabin painted with a dark color dope to remove the "raw wood" appearanec. It improves any gas job greatly and may be done at this time.

The fuselage should now be practically complete and should be lightly sandpapered to remove any drops of excess cement, etc., so it will be smooth when covered. All marks left by a circular saw where balsa has been stripped should be sanded out.

Next month the engine cowl, tail surfaces, wing panels and remaining details will be described.

Frontiers of Aviation

(Continued from page 29)

root sections to the tips the wing is wood with plywood covering. The ailerons, Handley Page slots and flaps are dural.

The fuselage is of steel tubing with dural stringers and frame-work covered with fabric except for the nose which is covered with sheet aluminum.

The stabilizer and fin are wood with plywood covering while the remainder of the tail group is dural with fabric covering.

The new Timm should prove very popular among sportsman pilots as well as for airline operation. Several modifications of the airplane for various uses have been contemplated such as a freighter or ambulance planes, and perhaps an all-metal model will be one of the future Timm aircraft. The Timm Company has been in business since 1910, and thus through its long years of experience is outstanding for the construction work at its shops which should prove its new product one of

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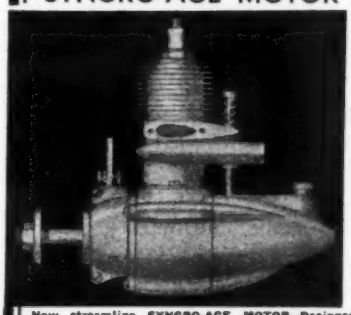

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WE ALSO STOCK THE FOLLOWING MOTORS FOR IMMEDIATE DELIVERY:

1937 Mighty Midget Motor	$16.50
1937 Inverted Mighty Midget	17.25
1937 Gwin Aero—With Exhaust Stack, Finned Head	17.50
1937 Gwin Aero, Inverted	18.25
1937 Brown Jr. Motor	21.50
1937 Baby Cyclone Motor	17.25
1937 Ohlsson Motor	18.50
Trojan Jr., ½ H.P.	18.50

THE SILVER FLYER is a trim stable flyer that will thrill you with its performance. 6 ft. span, 3½ ft. long. The kit is complete with finest quality balsa cut to size, cement, dopes, wing-ribs, formers, etc., printed, balloon balsa wheels, all metal parts needed, complete full-size plans and instructions. Shockproof landing gear, demountable wings, adjustable tail surfaces, etc., are only a few of the many fine features of this complete kit, which makes a sure flyer. Construction is very simple and rugged, making the ship easy to build and hard to crack up. Complete kit only..... $5.00 plus 50c shipping

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SPECIAL MONEY-SAVING OFFERS!

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with GWIN AERO MOTOR, only..... 21.50 postpaid
with OHLSSON MOTOR, only..... 22.75 postpaid
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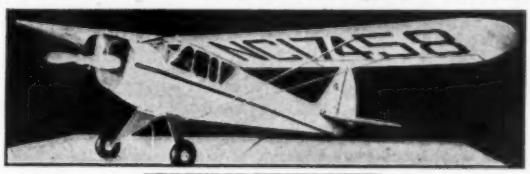
SAVE FROM $2.00 to $3.00! ORDER NOW!



NEW TAYLOR CUB GAS MODEL

THE TAYLOR CUB GAS MODEL KIT is the most complete on the market today. Each Kit contains COMPLETELY FORMED SHOCK ABSORBING LANDING GEAR STRUTS, CUT OUT WING RIBS, SEMI-FINISHED MONEL MOTOR MOUNTS, 3¼" super Balsa balloon wheels, finished cut-to-shape celluloid windshield, aluminum for cowlings, finest selected straight-grain balsa, spring steel tailskid, and many other features too numerous to mention here. The model has detachable wings for easy carrying, adjustable dihedral, and is one of the finest flyers you ever saw. Wing span is 6 ft., weight complete only 2¾ lbs. Complete dry kit, contains everything to make the best looking, finest gas model you ever saw (does not contain any cement or dopes) only..... $4.95 plus 75c shipping

Kit with airwheels, ½ pt. cement; pint dope, $7.25 plus 75c shipping.

MOTOR KITS

1937 Mighty Midget Motor Kit	$ 9.85
1937 Mighty Midget Kit—Inverted	10.10
1937 Gwin Aero Motor Kit	11.35
1937 Gwin Aero Kit—Inverted	11.60

Remember—You Get a Handy Model-Makers' Knife Free With Every Motor Kit!

Send 3c stamp for catalogue of gas model kits, motors, supplies.

CALIFORNIA BUYERS!—PLEASE ADD SALES TAX.

WE GIVE YOU TWO FREE PROPELLERS WITH EVERY ASSEMBLED MOTOR!

JAY'S MODEL SHOP—7763 Melrose (Dept. M-13)—Los Angeles, Calif.

the best built and best performing aircraft of its type on the market.

***3. Performance (estimated) (With Constant Speed Propeller)**

ITEM	ENGINES Wright R975E-3 420 H.P.	Wasp Jr. 400 H.P.	Wright R760E-2 320 H.P.
Gross Weight—lb.	7608	7688	7498
Horse Power—2 engines	840	800	640
R.P.M. at Rated Power	2200	2200	2200
Critical Altitude (ft.)	1400	5000	Sea Level
Fuel (Octane Rating)	80	80	80
Maximum Speed at Sea Level(MPH)	204	196	184
Maximum Speed at Critical Altitude (MPH)	207	210	184
Cruising Speed at 75% Power and Max. Cruising RPM (MPH)	193 @ 5000 ft.	196 @ 9600 ft.	168 @ 5000 ft.
Cruising Speed at 66% Power and 1900 RPM (MPH)	186 @ 8000 ft.	187 @ 11000 ft.	164 @ 6700 ft.
Stalling Speed Without Flaps(MPH)	70	70	69
Landing Speed at Sea Level (MPH)	59.5	59.5	58.8
Landing Run with Brakes (ft.)	375	375	360
Take Off Distance—Flaps Extended (ft.)	395	395	490
Take Off Time (Sec.)	10	10	12.5
Initial Rate of Climb (ft./min.)	1760	1680	1245
Time to climb to 5000 feet (Min.)	2.9	3.1	4.1
Time to climb to 10000 feet (Min.)	7.5	7.3	10.0
Absolute Ceiling—2 engines (ft.)	26200	27000	22000
Absolute Ceiling—1 engine (ft.)	14000	15200	8200
Gasoline Capacities (Gal.)	180	190	170
Endurance at Max. Speed (Hours)	2.43	2.58	2.90
Endurance at 75% Power (Hours)	3.65	3.88	4.25
Endurance at 66% Power (Hours)	4.23	4.50	5.02
Range at Max. Speed (Miles)	500	540	535
Range at 75% Power (Miles)	705	760	715
Range at 66% Power (Miles)	790	840	825
Fuel Consumption at Max. Speed (Gal./Hr.)	74.0	73.5	58.5
Fuel Consumption at 75% Power (Gal./Hr.)	49.5	49.0	40.0
Fuel Consumption at 66% Power (Gal./Hr.)	42.5	42.0	34.0

We might run through a list of orders received by our most prominent companies during the last few months: Douglas Aircraft was tops when it received a $11,651,948 contract from the War Department for 177 bombers similar to the 145 already on order. We have given a few of the details of the new ships in former issues and might add here that they will do about 225 m.p.h. or better. They will carry about four half-ton demolition bombs and six or eight machine-guns. The planes will carry much more load than their predecessors and will have long range radios and the latest Wright Cyclone engines. Of mid-wing design, the new bombers will be of the usual Douglas all-metal design.

North American who unfortunately lost to Douglas in the bomber competition when they entered their "Dragon" bomber were rewarded however with a $1,372,255 order for 85 basic combat planes and 10 additional spares. These ships will be delivered to the Army Air Corps together with a few hundred other North American planes now on order.

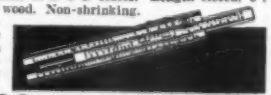
The Sikorsky division of United Aircraft Corporation was the receiver of a $1,960,790 order for 11 twin-engined amphibians. They are similar to the Sikorsky S-43 and are adapted for personnel use by the Navy.

Grumman received a Navy order for 15 general utility amphibians at a cost of $571,923. Lockheed received one for four Model "12" transports for the U.S. Navy.

Seversky was fortunate in getting one of those many orders from Russia that are floating around the United States there days. The order calls for two Seversky amphibians with an option on two more with full manufacturing rights for ships of the same model to be built in Russia. The amount of the contract is $780,000.

MANHEIM POCKET SLIDE RULE

Polished stainless steel back frame, flexible scale slide, glass hairline runner. A B C D scales. Length closed, 6". No celluloid—no wood. Non-shrinking. Accuracy guaranteed. In genuine leather case with instruction booklet. Only $1.00 postpaid.



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NEW LOW PRICES!

FREE On Orders of $1.00 or more Your choice of No. 1 or No. 2 OFFER!!

No. 1—6 Sheets White Jap Tissue 1 oz. bottle Cement

No. 2—2 Pr. any size Birch Wheels 25'— 3/32" flat Rubber

1/8" BALSA STRIPS

1/16x1/16 100 for	.05
1/16x1/8 35 for	.05
1/16x3/16 18 for	.05
1/16x1/4 15 for	.05
1/16x1/2 5 for	.05
3/32x3/32 30 for	.05
1/8x1/8 30 for	.05
1/8x1/4 10 for	.05
3/16x3/16 8 for	.05
1/4x1/4 6 for	.05
1/4x3/8 4 for	.05
1/4x1/2 3 for	.05
1/2x1/2 2 for	.05
For 36" Lengths double 18" prices.	

1/8" BALSA SHEET

1/32x2 4 for	.05
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3/32x2 7 for	.10
1/8x2 6 for	.10
3/16x2 3 for	.09
1/4x2 3 for	.10
1/2x2 2 for	.10

BALSA PROP. BLOCKS

1/2x3/4x5 8 for	.05
1/2x3/4x6 7 for	.05
5/8x1x7 4 for	.05
5/8x1x8 3 for	.05
3/4x1¼x10 2 for	.05
3/4x1¼x12 1 for	.03
1x1½x12 1 for	.04
1x1½x15 1 for	.06

1/8" BALSA PLANK

1x1	.05
1x1½	.09
1x2	.10
1x3	.15
2x2	.18
2x6	.39

CEMENT AND CLEAR DOPE

1 oz. bottle	.04
2 oz. bottle	.08

THINNER

1 oz. bottle	.04
2 oz. bottle	.07

CELLULOID DUMMY RADIAL—ENGINES

1½"	.09
2"	.13
2½"	.15
3"	.18

WHEELS (PER PR.)

	Brch.	Blsa.	Celu.
½"	.01	.03	
¾"	.02	.04	.05
1"	.03	.05	.07
1⅜"	.04	.06	.09
1⅞"	.07	.09	.15

RUBBER

3/32" flat—20'	.05
1/8" flat—18'	.05
3/16" flat—13'	.05

TISSUE "AA"

ALL COLORS—3 ..... .05

WIRE 36"

.014—.020—.028—.034
6 feet for ..... .03

BAMBOO

SHREDDED—36 ..... .05
1/16x1/4x15—6 ..... .05
Reed 1/32-1/16-⅛-3" .02

WASHERS

⅛" or ¼" O.D.—12 .. .01

THRUST BEARINGS

Small ..... 10c per doz.
Large ..... 13c per doz.

TRIANGLE PLASTIC BALSA WOOD FILLER

1 oz. bottle	.04
2 oz. bottle	.08

ORDERING INSTRUCTIONS: Cash or Money Order. No Stamps. No C.O.D. No orders less than .35. On orders up to $1.00 add 15c postage. Over $1.00 add 15%. Foreign add 20%. Over $2.50 post paid.

Dealers, Clubs, Send $.03 for special price list.

TRIANGLE MODEL SUPPLY CO.

32-57 38th Street Dept. H Long Island City, N. Y.

24 Hour Service

FREE POSTAGE
on all orders in U.S. east of Miss. for 75c or over. Under 75c, add 10c. West of Miss. add 10c extra. Canada, U.S. possessions, and foreign, over $1.00, add 15%. Foreign, under $1.00, add 15c. No C.O.D. No stamps.
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18" BALSA
1/16x1/16, 100, 5c
1/16x1/8 35 for 5c
1/16x3/16, 18, 5c
1/16x1/4 15 for 5c
1/16x1/2 5 for 5c
3/32x3/32 30, 5c
1/8x1/8 30 for 5c
1/8x3/16 12 for 5c
1/8x1/4 10 for 5c
3/16x3/16 8, 5c
1/4x1/4 6 for 5c
1/4x1/2 3 for 5c
1/2x1/2 2 for 5c
1/64x2 4 for 10c
1/32x2 8 for 10c
1/16x2 8 for 10c
3/32x2 7 for 10c
1/8x2 6 for 10c
3/16x2 3 for 9c
1/4x2 3 for 10c
3" sheets or 36" lengths, double above prices; add 10c packing charge for 36" lengths.

18" PLANKS
1x1 5c; 1/2x2 6c
1x1 1/2 9c; 1x2 10c
1x3 15c; 2x2 18c
2x3 23c; 2x6 39c
3x3 40c; 3x6 75c

TISSUE, AA
All col. ..doz. 19c
Silver ....ea. 5c
Superfine, wh. 5c

WHEELS per pr.

	Brch	Birch	Colu
1/2	.01	.03	
3/4	.02	.04	.05
1	.03	.05	.07
1 1/4	.04	.08	.10
1 7/8	.07	.10	.16
3		.15	.30

NOSE BLOCKS
1x2x1 ..... 1c
2x2x1 ..... 2c
2x2 1/2x1 ..... 3c
3x3x1 ..... 5c
3x3x2 ..... 8c
3x3x3 .....10c

INSIGNIA
24 and stripes 5c

THRUST BEARINGS
Small ....doz. 10c
Large ....doz. 15c

RUBBER
.045 .....25 ft. 5c
1/16 sq., 20 ft. 5c
1/8 flat .15 ft. 5c

WASHERS
1 doz. 1/8 or 1/4 1c

RUBBER LUBRICANT
Large bottle ..10c

REED
1/32-1/16 2 for 1c

PROP BLOCKS
1/2 x 3/4 x 5 8—5c
1/2 x 3/4 x 6 6—5c
3/4 x 1 x 7 4—5c
3/4 x 1 x 8 3—5c
1/2 x 1 1/4 x 10 3c-ea.
3/4 x 1 1/4 x 12 3c ea.
1 x 1 1/2 x 12 4c ea.
1 x 1 1/2 x 15 7c ea.

SHEET ALUM.
.0004x5x11 2—3c
.005 in. 6x6 5c
.010 in. 6x6 6c
.015 in. 6x6 8c
1/32 6x6..... 15c

CLEAR DOPE or THINNER
5c per oz.; large bottle, 8c; 1/2 pt. 30c; 1 pt. 45c

COLORED DOPE
6c per oz.; large bottle, 10c

CLEAR CEMENT
5c per oz.; large bottle, 8c; 1/2 pt. 35c; 1 pt. 55c.

MACHINE-CUT BALSA PROPS
5" 4c; 6" 5c;
7" 6c; 8" 7c;
10" 8c; 12" 10c;
15" 15c

DOWELS
1/16x6 ....doz. 5c

BAMBOO
1/16 sq.x12, 36, 5c
1/16x1/4 x1.5, dz. 10c

WIRE
6-8-10-12-14 .....2 ft. 1c

WOOD VENEER PAPER
20x30 ....1 for 10c

BAMBOO PAPER 2 for 15c

CELLULOID
6x8 .....5c
12 1/2x16 .....18c

PROP. SHAFTS, REAR HOOKS
Doz. 8c

CAMEL'S HAIR BRUSHES
Small 3c; lge. 5c

NOSE PLUGS
1/2" .....12 for 8c

DUMMY RAD. ENGINE (Celu.)
1 1/4" d. 15c; 2" d. 20c; 3" d. 25c

ENGINE AND COWL (Celu.)
1 1/4" dia.....15c
2" dia.....20c
3" dia.....25c

ALUM. TUBING
1/16, 3/32, 1/8 .....ft. 7c
3/16 or 1/4 ft. 10c

BUSHINGS
1/16 .....4 for 1c

WOND. WATER SPRAYER 15c

MODEL PINS
1/2" or 1" pkg. 5c

SANDPAPER
Doz. sheets.....5c

Gas Model Catalog, 3c
Dealers: Send for Wholesale Price List.

20 IN. FLYING PLANS 10c—3 for 25c
Sparrow Hawk, Boeing Trans. 247, Spad Chass., Vought Corsair, Curtiss Swift L. W., Waco Cabin Biplane, Douglas Dolphin, Boeing P12F, Fokker D-VII, S.E.5, Goshawk, Gee Bee, Boeing P26A, Monocoupe, Northrop Gamma, Fairchild 24 Cabin, Corben Super-Ace.
SELECT ANY 3 OF THE ABOVE PLANES IN 20" FLYING KIT POSTPAID 35c

SPECIAL RADIO OFFER
IMPERIAL EASY-TO-BUILD RADIO KIT
All parts mounted ready to wire up and plug in. Complete (less tubes) with necessary fittings, supplies, simple directions, and knock-down cabinet. The thrill of a lifetime—so easy even a child can assemble this new type 5 tube radio. Operates on A.C. or D.C. 115 volts. Your individual radio at a fraction of what you'd have to pay at any store.
Introductory Price **4.95**
Add 25c postage

IMPERIAL MODEL AERO SUPPLY
416G McDONALD AVENUE BROOKLYN, N. Y.

FREE offers with all orders for $1.00 or over:
1. Large bottle clear cement and 100 1/16 x 1/16 x 18 balsa
2. 50 ft. 1/8 flat rubber
3. 3 sheets silver tissue
4. Membership Pin in IMPERIAL MODEL CLUB

Major Alexander P. de Seversky was scheduled to make an attempt to break the world landplane speed record at the recent St. Louis Air Races in his latest ship. However circumstances prevented him from attending. Had he made the attempt the chances are that he would have broken the record of 352 m.p.h. now held by Howard Hughes! Recently he flew from Scott Field to Wright Field at an average speed of 340 m.p.h.! The distance travelled was 340 miles which was done in exactly one hour. Being able to average such a speed at that distance Major Seversky should be able to go exceedingly faster over a measured straightaway course. It would be helpful to American air racing to have this latest creation of Seversky's a contender in the forthcoming National Air Races. This is not very probable however because the plane has been built for military purposes.

Roscoe Turner may have his ship on hand though. Gossip has it that his racer is now being revamped at Kieth Ryder's shop. From apparent indications, unless Kieth Ryder is building another super racer, Roscoe Turner will be our only hope in holding America's speed supremacy at the 1937 National Air Races. Michel Detroyat will no doubt bring a faster plane with him than he had last year. At the Races in St. Louis no speeds were obtained that came anywhere near Detroyat's Caudron accomplishments. Rudy Kling, one of the big hopes at the Races, reached an average speed of 233.7 m.p.h. in one of the races while Art Chester did as much as 253.5 m.p.h. in his old "Jeep." Though these speeds are very good for the planes and engines used, nevertheless they will not keep France from retaining the Shell and Greve trophies. Roger Don Rae made a complete washout of the Folkerts Special formerly owned by the retired racing pilot, Harold Neuman, at St. Louis. Rae lived through the crash fortunately. Art Chester also narrowly escaped disaster when his "Jeep" made a forced landing when the engine stopped. Marion McKeen in his "Miss Los Angeles" showed a surprising burst of speed.

Joe Thorne, famous racing auto driver, purchased Milo Burcham's Boeing 100 for stunt flying at the St. Louis Races but his plane was not overhauled in time. His ship has been revamped at the Timm Aircraft Co. shops, and Joe has put in his entry for the Lindbergh Memorial Race. Jimmie Mattern is definitely in the race with his purchase of a new Lockheed "12." The ship will have huge fuel tanks installed at Timm's with a total of 900 gallons capacity. Expensive radio equipment will also be installed. The starting point of the race is still questionable.

The Interstate Engineering Corp., a new concern, has begun construction of a $200,000 plant adjacent to the Northrop and North American factories and will make parts for airplanes as well as designing and building Army and Navy ships. $180,000 worth of equipment will be included in the factory and about 300 men will start work as soon as the plant is finished.

Porterfield has also formed an organization for the design and construction of new type Army and Navy planes.

Vance Breese, always a prominent figure in aviation, is building a new five-passenger low-wing monoplane. Its wing will be monospar and of all-wood construction. The ship is being built at Hawley Bowlus's shop.

As Lockheed moves into its new modernistic factory orders are at their peak. While the first Lockheed "14" Sky Zephyr for Northwest Airlines is being test flown an order for four have come in from the new Trans-Canada Airline and one more to make a total of seven ordered by K.L.M. A fleet of eight planes, the fastest transports in the world, will be delivered to Northwest by Lockheed this Summer. Lockheed Electras are now being flown daily in Mexico, Cuba, Alaska, Poland, Roumania, Jugoslavia, England, New Zealand, New Guinea, Australia, Brazil, and Canada.

The Kinner Airplane and Motor Corp. has two contracts with the Navy for two different types of giant aircraft engines. One of these new power plants is said to be now undergoing tests for the Navy, having just been completed last month.

The tricycle landing gear mania has seemingly spread throughout the country. Curtiss is said to be well under way with a new ship incorporating a wheel in the nose. Crusader is revising an AG-7 model and is rumored to be contemplating the use of Wright engines and also a nose wheel. North American has also been giving the idea serious thought.

Build a Model of the Timm Transport

Build the entire model of balsa wood which may be purchased from any model airplane company. Get dimensions from the accompanying plans. If you wish to square off the plans, making for easier measuring, join the corresponding dots on the borders with straight pencil lines. Each square will equal one square foot.

Trace the various parts of the model on paper such as the right and left wing panels, the fuselage, tail surfaces, engine cowls and nacelles, and landing gear struts. Lay the paper on stock with the grain of the wood running lengthwise and go over the outlines with a pencil, pressing heavily so as to make an indentation in the wood. Cut around these outlines with a jig-saw and shave down with a sharp chisel.

Go over the surfaces with coarse sandpaper until all the grooves in the wood have disappeared. Then sandpaper the parts to smoothness with fine sandpaper. Purchase three wheels for the landing gear or carve them from wood and then begin the assembly.

Lay the fuselage in flying position on a flat level surface with props to hold it in place. It might be well to construct a jig from scrap wood for holding the fuselage firm as they do on the real airplanes. Then join the two wing panels to the fuselage with model cement and put blocks under them to hold them in place.

Connect the tail units next, applying plenty of cement. When those connections have dried cement the two engine nacelles to the wing. Shape out two propellers from scrap wood with a razor blade and with a straight pin as a shaft joint them to the front of the engine cowls. Lay the model on its back and with care and accuracy build up the landing gear. Insert two of the wheels into the pants and one in the nose of the fuselage. Small straight pins may be used as axles. Apply plenty of cement to the joints to insure strength.

Sandpaper the model once more and brush off all dust to prepare for the paint job. To make the color scheme conform with the real ship apply several coats of cream colored enamel. Permit the first coat to dry before applying a second. The windows should be painted white, the props silver and the fronts of the engine cowls and wheels black. After several even coats have been carefully applied, the model will be completed.

Rocket Flight In America

(Continued from page 5)

forth many new problems—problems that had to be solved before rockets could be shot successfully. It was because of the problems presented by the first series of tests that the society conducted a second and a third series, and have to this day

been experimenting with rocket motors. At present the astronautical engineers believe that a suitable motor has been developed. Although the motor design problem has not been completely solved, sufficient data has been made available through these tests to warrant the designing of a new repulsor capable of sailing skyward at tremendous speeds.

At the American Rocket Society's sixth annual public meeting held at the Museum of Natural History, it was announced by Mr. Pendray that the society is preparing for a few new rocket flights this summer. It is expected that through such flights more data can be obtained and that new problems in the aerodynamics of rocketry will be brought forth.

Another important but less spectacular problem connected with rocket research is that of landing the rocket without damage. As simple as the problem might first seem, it requires but little thought to understand its importance and the difficulties it presents.

Parachutes are undoubtedly one solution. However, to have a parachute released at the proper moment of the rocket flight it requires a simple automatic device which to this day has not been designed. The chute must open only when the fuel has been consumed and the rocket has attained its maximum altitude. Should the parachute open before the rocket has consumed its fuel and reached its greatest altitude, the flight is shortened and any data available from the flight will be unaccurate. Should the parachute open after the rocket has started to fall back to earth, the experimenter runs the risk of having the chute breaking loose from the rocket and his experiment being ruined when the bullet-like hull of his craft strikes the earth. As it is impossible to figure in advance the time it would require the rocket to reach its peak, timing devices cannot be used. Because the rocket and everything within it moves along as one unit, pendulums cannot be used. Thus the problem of releasing the chute becomes a major obstacle in the field of rocket research.

Among the many devices designed for releasing a parachute, perhaps the most interesting was that designed by John Shesta for Rocket No. 4. (See Fig. 5.) The design consisted of a cap fitting over the parachute case and below which was a spring. This spring, however, was designed so as not to be able to lift the cap off the case while the rocket was going up and gravity was acting upon it. The moment the rocket had reached its maximum altitude and before it started to fall earthwards the spring would throw off the cap and release a pilot chute. As there was a mishap during the flight of Rocket No. 4 it was impossible to test this device under actual conditions and it is impossible to say whether or not such a device would be successful. The success of the device, however, depends upon the rocket remaining in a vertical position throughout the flight.

Tucker Gougelmann, Secy. of the Westchester Rocket Society and a junior at Columbia University, has designed an equally interesting device. Mr. Gougelmann's device consists of a mercury tube which releases the parachute at the peak of the flight regardless of the position of the rocket. Laboratory tests, conducted at

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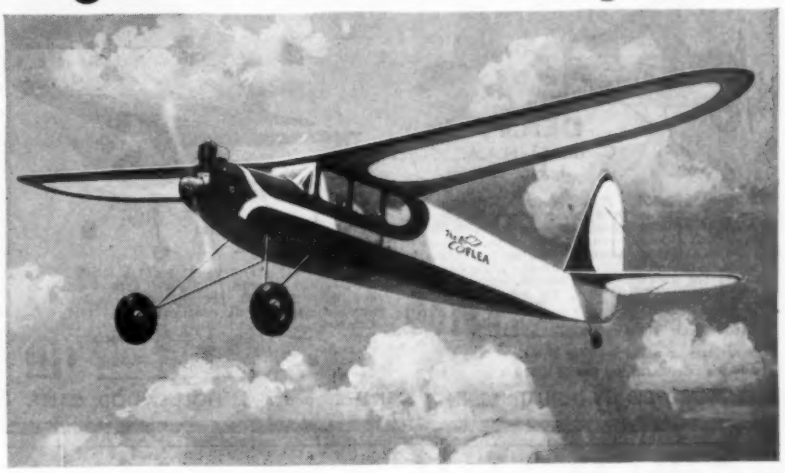

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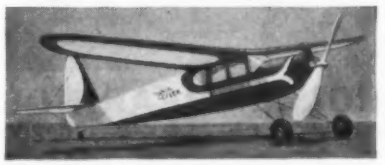

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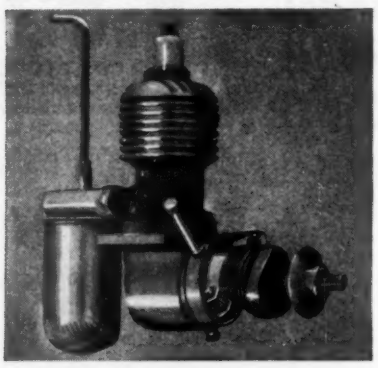

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New Rochelle, point conclusively to the fact that such a device would be ideal. An actual test flight is scheduled for May and the necessary equipment for the flight is now under construction.

Autogiro vanes have also been considered as a method of landing rockets. Although they have been used by Reinhold Tiling, no experimenter has been reported to have used them successfully and it is impossible to state any definite facts concerning their use. This phase of experimentation is still unexplored by astronautical engineers.

Because it requires time and money to continue rocket experimentation, Robert Esnault-Pelterie, a reputable French aeronautical engineer who also became interested in rocket research, considered presenting an annual award to stimulate and reward scientific research leading toward the solution of any of the numerous problems presented by rocket flight. After discussing the matter with Mr. Andre Hirsch, one of his friends, together in 1928 they established the International Astronautical Award (Prix REP-Hirsch.)

In order that the distribution of the award be as authoritative as possible it was placed in the hands of the French Astronomical Society. An astronautical committee was established so that papers received could be studied and results could be reported to the Astronomical Society. This committee was composed of members of the Academy of Sciences and advised the society as to the winners of the award.

Because of the excellent solution to many astronautical problems presented in his book "Die Rakete zu den Planetenraumen," Professor Hermann Oberth was the first to receive this award. As this work was of great importance the donors doubled the award for that year. No award was made the following year as no work of importance was submitted.

In 1930, a French engineer, Mr. Pierre Montagne, received the award with a report entitled "A Study of Gaseous Mixtures Utilizable in the Propulsion of Rockets." Although this report was a theoretical study of chemical equilibriums and temperature of gases within a blast chamber, it made possible the calculation of reaction taking place in a rocket motor fed with liquid fuel under constant pressure.

During the years 1931 and 1932 the award was not competed for. In 1933 the award was distributed to Mr. Montagne, for continued study of chemical equilibriums and their relation to rockets; and to Mr. Ary Sternfeld, a young Polish engineer.

Mr. Louis Damblanc was awarded a prize of encouragement with a sum of two thousand francs for his work with dry fuel rockets during 1934.

Although the amount of the Prix REP-Hirsch is not so great, it does stimulate and recompense serious scientific work in this new science—the science that someday historians will record as the key to interstellar navigation, the science that through the constant effort of Mr. Pendray, the high priest of American rocketry, and the American Rocket Society, has become centralized in our United States.

Airways—Here and There

(Continued from page 36)

and Spot Landing.

Fuselage Models—Same as Stick.

Scale Models—Same as Stick.

"Ralph Ward, last year's winner again won the Easter Cup, but came second in both the Spot Landing Event and Speed Events, which were won by Mervyn Kibby, who with a fuselage of his own design flying over an 88 foot course averaged 53 7/11 miles per hour.

"Since that contest, Merve has unofficially broken that time. He's now out to do 100 m.p.h.

"Over Easter the New Zealand Model Aeroplane Association held its usual events and the Hastings Club came 5th for N.Z. This is very creditable for Hastings is only a first year club. Also one of its boys won the N.Z. R.O.G. championship. Mr. Williams of Hastings, in sending me this news and the enclosed photos, failed to send the boy's name.

"Gas Models are now on the increase over here. On Easter Monday Jack Joll of New Plymouth broke the official N.Z. record of 3 minutes, 43 seconds, by flying his model for 6 minutes, 25 seconds, under very adverse conditions. This was his first model and first flight after two or three minor test flights. Of course this time may not seem much to you over there, but remember we're just beginning. Ted Pentecost, of whom I wrote in my last letter, the boy aged 12, is progressing nicely with his gas job and should have it finished in about one month's time. I'm not letting him rush it. Then I will have to let you know all about him. As far as I can gather he is by several years the youngest gas builder in New Zealand. How does he compare with you chaps over there?"

Philippine Islands

Great progress is being made in model flying in the Philippine Islands. Recently the first annual model airplane contest was held at Manila. It was sponsored by the Commonwealth Model Airplane Company and the judges were members of the U.S.

Army Air Corps at Nichols Field, Rizal, P.I. Mr. G. B. Carty of 414 Isaac Peral, Manila, P.I., who is responsible for a great deal of the activity here, tells us of the contest, as follows:

"Flying conditions were very good and the contestants had high hopes of bringing down the existing Philippine record of three minutes and eighteen seconds. The first, second and third flights proved to be uneventful, but as soon as the sun had risen sufficiently to warm up the field, flights grew longer, and about 9:30 in the morning a model built by Juan Gotauco of Manila, remained in the air for four minutes and twenty seconds and proved that our hopes of bringing down Philippine record were realized. This remained the best time of the contest until about 10:15 when a model built by Moses Mendoza, also of Manila, flew for six minutes and nine seconds and then disappeared over the trees in the far distance. This flight was the winning flight of the contest, while the plane built by Gotauco came in second. The third prize was taken by Bill Stacy, with a flight of three minutes and eighteen seconds.

"The remarkable thing about the entire contest was the almost total lack of models built from an established design or from a kit. The first five longest flights were made with models of original design or with models of standard design with modifications. This shows that the model builders of Manila are at least original, and our congratulations go to those people who are willing to sacrifice a possible place in a contest to test out an untried experimental job.

"Model building in Manila is suffering a serious decline at the present time due to extremely hot weather and high winds. The months of April, May and June in Manila and vicinity have high winds, blowing almost constantly from daylight to dark. The only possible time to fly models is in the very early morning and sometimes late in the afternoon. But as you perhaps know, there is very little daylight between dark and sunrise and sunset and darkness in the tropics.

"Our next contest will be held some time in late September or early October of this year, and we hope to have at least 75 contestants. The contest will be held in strict accordance with the existing N.A.A. rules, and we hope to better the Islands' unofficial record of 17 minutes and 8 seconds in this contest."

Picture No. 8 shows a group of the contestants in the Fuselage Stick Model event. It may not be long before our friends from the Philippine Islands will attend the Nationals in America. We sincerely hope so.

South Africa

Our Air Ways column would not be complete without news from South Africa. Mr. A. K. A. Garvie, president of the Johannesburg Model Aeronautic Club of P.O. Northlands, Johannesburg, South Africa, sends us picture No. 9. It shows something of the flying capacity of the ships being built in this country. This is one of the finest flight pictures that has appeared in this column, and the photographer should be commended not only on the photography but on the flight ability of the ship itself. The model belongs to K. Duke. It won the annual contest with a time of one minute, fourteen seconds. This picture was taken on its official flight. Mr. Garvie won the senior event Class D, Fuselage, with a flight of one minute, forty-five seconds. The weight was 6½ ounces. He says there was a twenty mile an hour wind blowing at the time, which destroyed quite a few of the ships entered.

South Africa expects to enter the Wakefield this year although they are in doubt as to their ability to qualify with the other contestants.

Mr. Garvie also sends us some information concerning his experiments with models which may be of interest to Air Ways readers. He says:

"I have been experimenting on the effect of our 6,000 feet altitude handicap and find that we have to add more rubber. For instance, on a model in which 16 strands are specified on the original plans, the model will do no time worthwhile, but when two strands are added the model will gain altitude and do two to three times the duration. I have tried this with 11 strands. My latest model, of 200 square inches and 16 strands of rubber, was made exactly as to plan and the best time I got was 35 seconds. I tried it with 18 strands and got 50 seconds.

"After that I changed my prop for one with slightly more area, and with the same amount of rubber the time increased slightly. I rebuilt the model, making it 6 ounces for the 200 square inches, added a larger.

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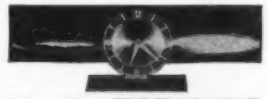

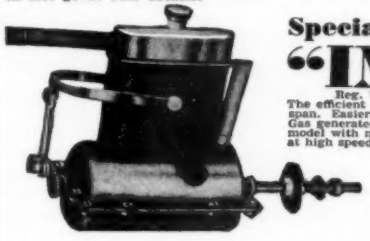

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prop and 24 stands of rubber and made minor alternations to the airfoil section. On my second flight I obtained 1 minute, 3 seconds.

"All these flights were without the aid of thermals. I allowed the nose block to drop out with about two inches of rubber, thus grounding it. I did this so as to be certain of no 'luck thermal'."

New Zealand

Picture No. 10 shows an interesting microfilm-covered indoor hydro built by Winston B. Mackley of 8 Ascot Avenue, Remuera S.E. 2, Auckland, New Zealand. Mr. Mackley is club captain of the Auckland Model Aero Club. This model has made a flight of 7 minutes, 24 seconds hand-launched. It holds the New Zealand senior record of 4 minutes 44 4/5 seconds.

It appears that the New Zealanders have been very unfortunate, inasmuch as they shipped their models for the Moffett contest before word of the new weight ruling reached them. It is indeed unfortunate that this should have taken place and possibly puts America in a bad light, considering that New Zealand holds the trophy and it is up to America to win it back. Our New Zealand friends may be assured, however, that this arrangement was not planned. It was due to confusion in organizing the National contest and in trying to get together model leaders from all over the vast territory of the United States to formulate suitable rules for the Moffett event for the future.

England

Mr. E. Crichton Daniels, secretary of the Windsor Model Aero Club of 17 Sibson Road, Chorlton-cum-Hardy, Manchester, England, writes as follows:

"Perhaps you would like to inform the fellows over your side, that I should welcome a bi-monthly exchange of news, photographs and plans, with one of the American clubs. Perhaps the W.M.A.C. is not widely known in the States, but that is because we have not previously sent you any news or photographs, although the club was one of the first to be established in the north of England, and was I believe the only English club on last year's U.S.A. Census of clubs, a fact which has been instrumental in keeping us informed of the latest products by your manufacturers. The members are however, well informed of activities in America as MODEL AIRPLANE NEWS is always on the magazine table in one of the Common Rooms"

Holland

We hear from G. Roords van Eysinga of Rosen Drunplein 20, Bloemendaal, (by Haarlem), Holland. He is most interested in American planes and would like to have anyone write to him who would care to exchange pictures of such ships for foreign planes. He is particularly interested in pictures of the Boeing 299 and the Seversky P-35.

Australia

Mr. Greg Barnes writes something of interest from District School, Camden, New South Wales, Australia. He says:

"Glancing through back numbers of your magazine I noticed that you asked for the results of experiments with model autogiros, so I would like to tell other builders that it *is* possible to make small flying models. I have just recently built a model which performs very satisfactorily. Its general dimensions are:

"Length, 15"; length of each of the three rotor arms, 17"; chord of each of the three rotor arms, 1⅛"; landing gear track, 7½"; propeller diameter, 7". The propeller is of the broad blade, medium pitch type, driven by an ordinary rubber motor. The rotors have a standing airfoil section and rotate from right to left. The rotor bearing is fitted with a free wheeling shaft to which is attached a short, single strand motor. The fin and stabilizer surfaces are very large as compared with ordinary models, because the rotors set up plenty of torque.

"When flying this machine I put the maximum number of turns into the propeller, and about thirty into the rotor motor.

"The model takes off steeply after a run of about eight feet and when the motor runs down, the rotors continue to revolve. The model climbs gradually until the propeller motor runs out, then it glides steeply down and lands almost vertically."

Japan

Donald Moran of Shukugawa, Nishinomiya, Japan, sends us some interesting information concerning model airplanes in Japan. It is given here in order that you may understand how model plane activities have progressed in this far-off country.

MODEL AIRPLANES IN JAPAN

Air Engine

Air-engined model airplanes are now becoming popular among the amateur model plane makers here in Japan, taking the place of rubber-powered model planes which had been constructed hitherto largely. This is because air engines are now easily obtainable here and their use is widely known among the amateurs. Remarkable progress in the making of this type model has been reached in the last two or three years.

At present 3 kinds of air-engines are offered for sale in model airplane material stores here. They are: 3 cylinder radial (weight 50 grammes), 4 cylinder V type (weight 63 grammes), 5 cylinder radial (weight 90 grammes).

These engines are made of brass, and radial types are rotary. Air-tanks used are 8 m/m dia. 55 m/m length, weight 210 grammes and are of thin brass tubes surfaced by steel wires. Aired by hand pumps, the pressure reaches up to 100 lbs. Air engines are 6,000 r.p.m. and about 1/20 hp. can be produced.

Model airplane fans here now construct two types of planes. One of them is scale model of actual aircraft and the

other is original free type constructed especially for racing. Duration time record by scale model airplanes in Japan is only 2 minutes and this poor record is attributed to the fact that the planes must be constructed in outward appearance entirely the same as actual aircraft. Duration time record by free type planes is 6 minutes and 30 seconds made in Tokyo. However, recently a model airplane maker in Sapporo, Hokkaido, is said to have made a record of 8 minutes.

Gasoline Engine

Gasoline engines for the use of model airplanes are not offered for sale here in Japan.

Mr. K. Nakaoka, one of the earnest model plane makers, ordered from U.S.A. a gasoline engine for his scale model plane of Japanese Army 91 type fighter monoplane; span 2 m., length 1 m., weight 1,875 grammes. In October, 1935, he conducted a test flight of his new plane at Yoyogi Military Parade Ground, Tokyo. The plane stayed in the air for 1 minute and 40 seconds. This gasoline engine is switched on by a self-timer of the camera and is said to have capacity of more than 25 minutes.

Rubber Power Model
Free Type

Duration time record in Japan by free type tractor model airplanes is 2 hours and 25 minutes made by Mr. K. Natori, Omiya, Saitama Prefecture on July 12th, 1933. One of the other remarkable records is by Mr. Kubotani for 27 minutes across The Lake Kasumigaura. Needless to mention, these records were made not by their own power, but by soaring, by climbing air stream.

As to the craftsmanship and materials, big progress in the manufacture and good selection of materials are noteworthy. Balsa woods are not largely employed here, but Hinoki (Port Orford Cedar) is mainly used.

Bamboo plays the important part in the making of model planes. Thin steel wires and aluminum tubes are used for connection of bamboos. Japanese silk cloth is indispensably employed for covering wings and fuselage, etc.

Scale Type

Of scale type model airplanes, we have a duration time record of 20 minutes. Equipment of a gear for rubber-powered model planes made it possible for a large type of span 2 m. to fly more than 1 minute.

Until a few years ago the All Nippon Model Airplane Race had been held in Tokyo once a year under the auspices of the Imperial Japanese Aviation Association. However, this feature is now discontinued. Only local meetings are being held under the auspices of local model plane material stores. It is expected, however, that the All Nippon Race will be resumed this year in response to the eager desires of the City and local model plane fans.

United States Wakefield Contenders Sail for England

The subscription fund to defray the expenses of the Wakefield contenders' trip to England fell far short of the amount necessary to send six boys across to enter the competition. About $150 was all that was donated. However, Herbert Fisch won first place on the Wakefield team in the Nationals. Dick Bodel placed well up towards the top. Both of these boys are from Akron, Ohio. Because of this several public-spirited people of Akron donated $450 more to send these two boys to compete in the International Wakefield Competition.

They sailed on Wednesday, July 21st, on the "Berengaria." Frank Zaic, who intends to take an extended tour of Europe, sailed on another ship, ignorant of the good fortune of these two young men.

MODEL AIRPLANE NEWS and all American model builders wish them the best of luck and they may be sure that all at home here will be rooting for their success and hoping that they will bring back the coveted trophy.

Rockford, Illinois

Edgar R. Picken of 1230 Camp Avenue, President of the Pla-Mor Wings Model Airplane Club, tells us something of their activities. He says:

"The club was organized about four years ago and last fall was made a chapter

Rubber-Powered Model Supplies At Prices Never Before Offered In Model Airplane News

18" BALSA 1/16x1/16 ....100, 5c; 1/16x⅛ 35 ....for 5c; 1/16x3/16 ....18, 5c; 1/16x¼ 15 ....for 5c; 1/16x½ 8 for 5c; 3/32x3/32 ....30, 5c; ⅛x⅛ 30 for 5c; ⅛x3/16 12 ....for 5c; ¼x¼ 10 for 5c; 3/16x3/16 ....8, 5c; ¼x¼ 6 for 5c; ¼x½ 3 for 5c; ½x½ 2 for 5c

18" SHEETS 1/64x2 6 for 10c; 1/32x2 8 for 10c; 1/16x2 8 for 10c; 3/32x2 7 for 10c; ⅛x2 6 for 10c; 3/16x2 3 for 9c; ¼x2 3 for 10c; 3" wheels or 36" lengths, double above prices; add 10c package charge for 36" lengths.

18" PLANKS 1x1 5c; ½x2 6c; 1x1½ 9c; 1x2 10c; 1x3 15c; 2x2 18c; 2x3 23c; 2x6 39c; 3x3 40c; 3x6 75c

PROP. SHAFTS, REAR HOOKS doz. 8c

CELLULOID 6x8 ....5c; 12½x16 ....18c

INSIGNIA 24 and stripes 5c

SHEET ALUMINUM .0003x3½ 6ft 5c; .005 in. 6x6 5c; .010 in. 6x6 6c

PROPELLER BLOCKS ⅛x ¾x 5 8—5c; ⅛x ¾x 6 6—5c; ⅝x1 x 7 4—5c; ⅝x1 x 8 3—5c; ¾x1¼x10 2—5c; ¾x1¼x12 2c ea.; 1x1½x12 4c ea.; 1x1½x15 6c ea.

IMP. PROPELLERS

Type	Standard
5" Diam.	.05
6" Diam.	.08
7" Diam.	.09
8" Diam.	.12
10" Diam.	.17
12" Diam.	.22
13" Diam.	.25
14" Diam.	.30
15" Diam.	.35

DUMMY RAD. ENGINES 1¼" d. 18c; 2" d. 20c; 3" d. 25c.

GUNS WITH RING MOUNT 1¼" 10c. 1¾" 13c.

NOSE BLOCKS 1x2x1 ..... 1c; 2x2x1 ..... 2c; 2x2 1/2x1 ..... 3c; 3x3x1 ..... 5c; 3x3x2 ..... 8c; 3x3x3 ..... 10c

REED 1/32-1/16-⅛ ....6 ft. for 3c

BAMBOO 1/16 sq.x12, 36, 5c; 1/16x¼x15, dz. 10c

MODEL STANDS Small 15c

RUBBER .045 ....25 ft. 5c; 1/16 sq., 20 ft. 5c; ⅛ flat..18 ft. 5c; Skein 50c

WASHERS 1 dz. ⅛ or ¼ 1c

THRUST BEARINGS Small ....doz. 10c; Large ....doz. 15c

NOSE PLUGS ½" ....doz. 8c; ¾" ....doz. 15c

WIRE 6-8-10-12-14 ....6 ft. 3c

DOWELS 1/16x6 ..doz. 5c; 1/8x18....2 for 3c; 3/16x1/4..2 for 5c

SANDPAPER 5 sheets....5c

WOOD VENEER PAPER 20x30..1 for 10c

ALUM. TUBING 1/16, 3/32, ⅛ ft. ....7c; 3/16 or ¼ ft. 10c

WHEELS per pr.

Birch	Bias Cellu
½ .01	.05
¾ .02	.04 .05
1 .03	.05 .07
1¼ .04	.05 .10
1⅞ .07	.10 .16
3 .20	.15 .30

CAMEL'S HAIR BRUSHES Small 3c; Lge. 5c; Extra large....8c

PURSUIT MACH. GUNS ¾", 1¼" or 1¾" each 5c

BOMBS ¾" 4c; 1¼" 7c; 3" 12c

METAL PROPELLERS 2 blades 3 blades 1¼" 5c ..... 8c; 2½" 10c ..... 10c; 3½" 15c ..... 20c; 4½" 20c 25c

CELLULOID PANTS, per pair ½" to 1" ....18c; 1¼" to 1⅞" 33c

ALUM. COWLINGS 1¼" 15c 2" 18c; 3" 25c 4" 40c. Specify whether anti-drag or closed

MACHINE-CUT BALSA PROPS

5" 4c;	6" 5c;	
7" 6c;	8" 7c;	
10" 8c;	12" 10c;	15"....18c

ENGINE AND COWL (Celia.) 1⅛" dia. ....18c; 2" dia. ....20c; 3" dia. 25c

CLEAR DOPE OR BANANA OIL 1 oz. 5c 2 oz. 7c; 4 oz. 13c 1 pt. 45c. Thinner same price as clear dope

COLORED DOPE White, yellow, orange, blue, red, green, olive drab, black, silver, gold, 1 oz. .06 2 oz. .10; 4 oz. .19 1 pt. .35

COLORLESS CEMENT 1 oz. .05 2 oz. .08; 4 oz. .15 1 pt. .50

TISSUE, AA All col., doz. 19c; Silver ....ea. 5c; Superfine, wh. 5c

BUSHINGS All sizes doz. 5c

WOND. WATER SPRAYER 15c

MODEL PINS ½" or 1" pkg. 5c

WING AND TAIL LIGHTS 12" 10c; 15" 15c; 24" 20c.

CHAMPION GAS-POWERED KITS

All our kits are guaranteed. Send for packing and postage on each kit 50c

THE CHIEFTAIN 7 ft. 4¾ lbs.

One of the steadiest fliers, over 700 successful flights, complete in all respects; full-size wood, plans, wire, cement, dope, bamboo paper, blocks, wheels, etc., etc.

STANDARD SET, ONLY.....$4.00
DE-LUXE SET, ONLY.....$7.00

THE "BULLPUP" 7 ft. Wt. 5 lbs.

This kit contains full-size wood; plans, cement, paper, etc. Same ar Chieftain.

STANDARD SET, ONLY.....$4.50
DE-LUXE SET, ONLY.....$7.50

THE HEATH STARLET 6½ ft. Wt. 4 lbs.

The best ship of them all complete and guaranteed in all respects full size strips; plans, cement, dope, etc. Same as our Chieftain Set.

STANDARD SET, ONLY.....$3.00
DE-LUXE SET, ONLY.....$5.75

ALL OUR DE-LUXE MODELS contain in addition to the regular materials supplied in each kit; 1 finished carved propeller, 1 pair air-wheels, 1 set cut-out ribs; 2 ½-pint cans of any colored dope. Buy the De-Luxe models and save money.

GAS MODEL SUPPLIES AT PRICES THAT DEFY COMPETION

LUMBER GAS MODELS—ALL FIVE FOOT LENGTHS The following wood can be had in Spruce, Bass, or Balsa at the Same Prices as those listed below.

⅛x¼x½	$ .03
⅛x¼x¼	.03
⅛x½	.07
3/16x3/16	.04
3/16x⅜	.05
3/16x½	.07
3/16x1	.08
¼x¼	.05
¼x½	.06
¼x1	.10
¾x⅜	.09
½x½	.10
½x1	.18
1x1	.25

SHEET BALSA (Special for Gas Models)

36" Lengths

1/16x2	.04
1/16x3	.06
3/32x2	.05
3/32x3	.09
⅛x2	.05
⅛x3	.09
3/16x2	.07
3/16x3	.11
¼x2	.09
¼x3	.15
½x2	.18
½x3	.30

For Five Foot Lengths in Sheet Balsa, Double Three Foot Length price.

REED ⅛", 3 ft. for .05; 3/16, 3 ft. for .07

BIRCH DOWELS 36" Lengths

3/16 dia.	.04
¼ dia.	.05

SPUN ALUMINUM WHEELS 5" dia. per pair only $1.50

GAS MODEL WHEELS Special pneumatic wheels good for gas model from 3" to 8". Size 3½". Price pair $1.50

Carved Props for any Motor, each only....$1.00

BAMBOO PAPER 24"x36" sheet .05

SHAPED PROPELLER BLANKS Specify size of prop & Motor, each only....25c

TOGGLE (ON-OFF) SWITCHES, 45c

MINIATURE KNIFE SWITCHES 2 poles..25c each; 3 poles..35c each

CEMENT & DOPES These liquids are specially made for gas powered models and should not be confused with those used for rubber powered models.

4 oz.	.18
1 pt.	.80
1 qt.	1.00

Gas Model dope and paper adhesive same price as cement.

SPRING STEEL WIRE (In five, 5-foot lengths)

1/16 dia. 5'	.05
3/32 dia. 5'	.15
⅛ dia. 5'	.25

DURAL ANGLE BEAM

⅛"x1½" foot	.20
¾"x¾" foot	.30

SHEET CELLULOID 12x16 sheet .18

COLORED DOPE All Colors

4 oz.	.20
1 pt.	.65

ALUMINUM TUBING

1/16 dia. ft.	.08
3/32 dia. ft.	.09
⅛ dia. ft.	.10
3/16 dia. ft.	.11
¼ dia.	.12

MODEL MAKERS KNIFE each ..... .10

SHEET ALUMINUM 1/32", 6"x6" .15; 1/16", 6"x6" .28

SPECIAL JAP SILK Grade A silk per yd. .... .40

MODEL MAKING PINS per 100..... .05; T Pins 50 for .10

FREE PREMIUM COUPONS with all orders from HEATHE. These coupons can be exchanged for AIR WHEELS, GAS MOTORS and many other valuable gifts. Coupons and catalog with every order.

New $100 Prize Contest

20 BIG WINNERS

First Prize—BROWN, Jr. Motor ($21.50 Value); 2nd to 10th—A pair of 3½" High-Pressure Pneumatic Air Wheels 11th to 20th—$1.00 worth of any supplies.

FREE Rush your request for (1) details of this new, simple contest. (2) Free Plan for a 15" Flying Scale Model (3) Catalog of interest to every model plane builder.

How to Order Add 15c to orders under $1.50. Orders over $1.50 add 10% of order. Add 20c to all orders that contain balsa or wire in 5-foot lengths to cover special handling. All orders shipped same day received.

HEATHE MODEL AIRPLANE CO. 436-E9 East 98th St. Brooklyn, N. Y. Complete Lists on Request. DEALERS—Write for Discounts.

QUALITY AT BARGAIN PRICES

Curtis Hawk P6E

One of our 12" Flying Model Series—8 more kits of these Famous models—Monocoupe D145, Page Navy Racer, Stinson Reliant, Heath Baby Bullet, Fokker D7 & Triplane, Boeing Transport and Fairchild 24 **15c** post paid each

Endurance Deluxe

Flying Contest Model of Sensation. 3 and 5 minute flights ordinary. 32" wing spread. Kit com. plete, full-size plan—everything, only **$1.00** post paid

With M & M wheels **$1.45**

Free Folder on complete line of R.O.G. and Scale models from 4c to $1.50

AIR-KING MODEL CO. 2934 S. E. 50th, Portland, Oregon

PEERLESS GAS MODEL

Taylor Cub

2 in. Scale
6 ft. Span
$5.50

A PROVEN GAS MODEL DESIGNED FROM A PROVEN, PRACTICAL LIGHT PLANE

Uses any standard make motor though preferably the lighter ones.

The color scheme follows that of a standard Cub, being all yellow with license numbers and striping in jet black. Thus it is visible at great distances. The landing gear of strong wire is easily made; it follows the real airplane as far as is practicable, and if built correctly, eases the model to a safe landing every time.

Wings, landing gear, tail surfaces, and motor are all easily removable for transporting to and from the flying field. This also makes it much simpler to effect repairs, when necessary. Also the windshield and motor cowl are removable for getting at the motor and battery box.

This kit is complete. Included in it is all necessary material for constructing the model exactly as seen in the picture here. Among the items are finished balsa balloon wheels, yellow colored dope, Quik-Set Cement, Tissue Cement, lots of heavy gas model bamboo tissue, heavy wire, fine threaded nuts and bolts, special threaded brass rod for fastenings, thread for wrapping joints, model pins for nails, smooth, clean cut strips of matched weight for fuselage and wing spars, printed wing ribs, printed fuselage bulkheads and tail ribs, all on smooth white balsa of the proper selected grade and best of all a full size detailed plan with pictures showing the model under construction and completed. Clear notes and instructions are right on the drawing where you need them.

An innovation in model construction is the COLOR CODE to help you identify the different strips of balsa and bass used in building this model. All the strips are colored at one end, and in this kit you will find a printed sheet with the material sizes and their uses on it. By following this, you cannot make a mistake in the selection of material.

Complete Kit, less motor, with balsa wheels..... $5.50
Complete Kit, less motor, with pneumatic rubber airwheels and single pole double throw snap switch..... $6.90

(Add 50c to either Kit West of Denver or to Foreign Countries)
Send 5c and Dealer's Name for latest catalog. No. 7.

THE PEERLESS MODEL AIRPLANE CO.
3088T W. 106th St., Cleveland, Ohio

of the N.A.A. under the leadership of Dr. Spickerman of the Chamber of Commerce. The club held an outdoor meet last fall to climax the season and then directed its activities to indoor work. An indoor meet was held in the new National Guard Armory last winter, which attracted about fifty entrants including many from neighboring cities. About 10½ minutes was the best time, which was considered fairly good due to the limited space. The meet was very successful in arousing public interest and in securing new club members.

"The club has held meetings regularly and all types of programs have been presented. Many men actively engaged in various phases of aviation have been our speakers and motion pictures on related subjects have been shown. The older members have regularly held open forum discussions on model subjects, principles and development and have launched the club on a directed movement of experimental work to gain experience as rapidly as possible with the aim of holding some world records.

"We are progressing very rapidly now."

Allentown, Pa.

George Micott of 241 North 12th Street, Allentown, Pa., writes:

"At a recent indoor contest in Philadelphia, held at the 108th Field Artillery Armory, Broad and Susquehanna Avenue, I set a new world's record for Baby R.O.W., Class A, models with a flight of 8:05.4 minutes, as compared with the former record of 7:41 minutes, held by Colman Zola of Brooklyn, N.Y."

Aviation Advisory Board

(Continued from page 31)

the wing.

Question: Is there any more accurate way other than cutting out a silhouette or side view of an airplane and determining its point of balance, for finding the lateral area of a plane?

Answer: No, this is the most practical and simplest.

Question: What is the fastest speed ever attained by a rubber-powered model?

Answer: Inasmuch as we have not been informed of all speed records it is impossible to state absolutely what the fastest speed is. However we know of models which have travelled seventy-two miles per hour.

Question: Is there any formula for finding the needed volume of an amphibian body and also pontoons?

Answer: We do not know if there is any one particular formula. However there is a series of calculations which engineers usually fit together in order to determine the volume of pontoons. The general procedure is as follows: Divide the total weight of the airplane by sixty-two pounds, the weight of one cubic foot of water. This gives the amount of water displaced by the pontoons of the airplane. The pontoons should be about six times this volume. If on a model you find that the displacement is one cubic inch the total pontoon volume should be about six cubic inches.

Mr. R. L. Taylor of 3499 South 13th East, Salt Lake City, Utah, wishes to know something about the articles entitled, "Aerodynamic Design of the Model Plane."

Question: Are these articles available in any other form except as articles in the issues of MODEL AIRPLANE NEWS?

Answer: At present they are not available in any other form. However, in a very short time they will be published in book form and available to all model builders. This series has been running for five years.

Question: Are the principles given in the articles applied to gas models?

Answer: Yes, they are.

Question: How are the angles of the wing and stabilizer determined and how are these surfaces set at these angles?

Answer: A very simple and practical system is to assume that the angle of one degree is measured by a rise of 1/16" in four inches of run. Otherwise, if the chord of your wing is four inches in order to give it an angle of incidence of three degrees the center of the leading edge must be raised 3/16" higher above the thrust line than the trailing edge of the wing. If the chord of the wing is six inches then one degree will be equivalent to a rise of 3/32" or one and a half times one-sixteenth of an inch.

Question: Where is it possible to get super-detailed planes for building scale models?

Answer: This is one of the great difficulties encountered by model builders. Manufacturing companies are very reluctant to give out super details of their planes as they wish to keep structural methods and features of design more or less secret. However some concerns will send plans if the model builder requests them and offers to pay.

MODEL AIRPLANE NEWS is endeavoring to supply this need and in this issue scale model builders will be delighted, we are sure, with the presentation of the "Hawk 3-C," by William Wylam. We believe readers will find this one of the most elaborate and inclusive sets of detail planes ever published in any magazine. In the future more plans of this type will be presented.

Question: What airfoil would you recommend for a stable slow-flying biplane?

Answer: Any Airfoil which has a re-

Sensational Bargains

Length—43¾"
Height—2"
Weight—2 oz.
Power—App. 1/10 H.P.

ACE MOTOR
$1.95
complete Kit

Easily installed and will positively fly Rubber Band models from 36 to 60 inch Wingspan. The simplest, safest and lowest cost motor unit. Operates on Carbide, Dry Ice and Water. R.P.M.—App. 500 to 3000. No Machining to be done. Starts instantly, runs smoothly, economically and powerfully.

KIT Complete with all parts, simple blue prints and easy instructions **$1.95** (plus 25c postage)

Built and ready to run—only $3.00 (plus 25c postage)

ACE DOUGHNUT WHEELS

Lowest price Air Wheels on the market! Suitable for models from 36 to 60 inch Wingspan. Simple to inflate and deflate. 2 Bronze Bearings in each Hub; will not tear out. Equal in quality and performance to most expensive wheels.

2 Tires—2 Hubs—2 Hub Caps—1 Inflating Tube..... **50c** postpaid

3 complete pairs for only $1.25 (postpaid)
Quantity limited—Send orders NOW!

ACE MODEL WORKS, Dept. M-9
1588 Lincoln Place, Brooklyn, N. Y.

versed curve or a downward camber on the under airfoil surface should be a proper airfoil. Usually in the case of a biplane, stability is attained more easily and therefore a more unstable airfoil may be used.

For high efficiency and slow flying we recommend that you use the Grant No. 3 airfoil, the one used on Joe Kovel's KG model. The characteristics of this airfoil on the gas job is known, inasmuch as it has been tried out thoroughly on several ships.

Question: What determines a high glide, for instance 20 to 1 as compared to 7 to 1? Is it larger wing area, less dihedral, longer tail moment arm?

Answer: Each one of the things enumerated, such as tail moment, wing area, dihedral, may be the cause of a good glide or poor glide. However, in themselves they have nothing to do with the glide ratio of an airplane. It is only in combination of one with another that it may affect the glide. A good glide may be had with a large dihedral or a small dihedral, depending upon the plane; a short moment arm or a long moment arm, large wing area or small wing area. The gliding ratio is representative of the lift of the machine compared to its resistance. The way to increase the glide is to decrease the head resistance of the airplane, either by streamlining the structure or by using a wing which gives a high lift with little resistance, or both.

Sometimes the set of the tail causes a poor glide because it is at such an angle that the full glide capacity of the plane is not developed. If a longitudinal dihedral of about three and a half degrees is used the wing will be passing through the air at about the most efficient angle and therefore should give the best glide, in the case of a glider. Two degrees should be used on power ships.

N.A.A. Junior Membership News

(Continued from page 14)

The contestants as well as the directors were extremely grateful to the Chevrolet Motor Co. for providing lunches on the field Saturday and Sunday.

Ignition Specialties

FLIGHT TIMER

$3.00
Postpaid

Special Bi Motor Timer	$3.50
Firecracker Standard Coil	2.50
Big Shot Coil	3.50

NATHAN R. SMITH
1814 W. 8th St., Los Angeles, Calif.

31% MORE OHLSSON MOTORS
in 1st Annual Contest of the Southern California Gas Model Ass'n.
4 of the first 10 places taken by
OHLSSON POWERED MODELS

Once more Ohlsson Motors set a record. Official entry lists prove that out of 160 entries and 11 different makes of motors, 31% more models were powered by Ohlsson Motors than by any other make. And 4 of the first 10 place winners were Ohlsson powered ships. Model builders everywhere know that Ohlsson design and construction gives them more power and the dependable performance that means more successful flights. Radial mounting, all-steel cylinder, machined to .0001" tolerance, sheer-ground piston and platinum timer point with complete interchangeability of all parts are exclusive Ohlsson features that insure better performance. For your model, get the best,—get an Ohlsson Motor.

EACH MOTOR is assembled and factory tested before shipment. SOLD ONLY as an assembled unit. 1/5 H.P. Complete..... **$18.50**

MAIL THIS COUPON NOW!

Ohlsson Miniatures,
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☐ Rush me one factory assembled and tested Ohlsson Radial Mounted Motor. I enclose money order for $18.50.

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A feature which graced the National Contest the first time was an exposition of model supplies, periodicals and scale models. A special room at the Fort Shelby Hotel was set aside for this purpose and many visitors obtained a very clear conception from this of the progress being made in model aeronautics. This will be featured at every National Contest held in future. Great credit is due to Mr. Irwin Polk and Mr. Nathan Polk who conceived and developed the idea of this exposition.

As usual, prominent personalities were present, among them: Mr. Carl Goldberg, who has been associated entirely, as every model builder knows, with indoor models. He sprung the greatest surprise on the contestants when he appeared with one of the finest gas models on the field. He informed his brother contestants that he is now concentrating his energies in this direction. Mr. Maxwell Bassett, who is the father of gas model aviation in this country, in conjunction with Bill Brown, appeared with several ships of the usual Bassett design. In the open class he walked away with first place with a 70 min. flight. Everybody wonders how he does it. It appears that each contestant has a theory concerning Bassett's ability to win consistently.

Among other prominent builders present were: Messrs. Vernon Boehle, Jim Cahill, John Dilly of Canada, Bruno Marchi and Wilber Tyler. Any of those who wish to know all the other prominent builders need only examine the list of winners.

Considering the fact that only a few weeks were available to prepare the many details of the contest, it was a huge success. Few people have any conception of the complications involved in such affairs. As usual, unfavorable as well as favorable comments were heard among the contestants. It appears that no one can run a contest without some difficulties arising. We are still to have a National Contest which is 100% perfect.

The contest was sanctioned by the National Aeronautic Association and conducted under the auspices of the Detroit N.A.A. Chapter. Mr. Thomas B. Colby was responsible for the carrying on of the contest. He was most generous in providing funds, which is always most essential. Without him we believe the affair would have been impossible.

The meet was managed by Mr. Irwin S. Polk. Mr. H. M. Jellison was the Contest Director. The committee which gave assistance in all phases of the work is as follows: Thomas B. Colby, Chairman, A. D. Althouse, Peter B. Altman, Major F. R. Anderson, W. R. Angell, Jr., Henry Baker, Robt. Ball, C. E. Brewer, Capt. C. V. Burnett, Harvey Campbell, Col. H. B. Claggett, William R. Enyart, Squire D. Eurich, Col. Floyd E. Evans, Robert B. Evans, L. A. Faunce, Leslie Field, Harry Gardiner, Com. Chas. F. Greber, Royce Howes, William A. Mara, George Pierrot, W. J. Scripps, William B. Stout, George Tabraham, A. J. Vhay and H. S. Walesby.

The Field Director was Mr. Charles

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ONE OF THE HUNDREDS OF LETTERS WE RECEIVE

326 Myers Pl., Inglewood, Calif.,
May 23, 1937.

Mr. Douglas Kruse.
Dear Sir:—
I thought it might interest you to know that a model made from one of your Aero-Glide Kits made a beautiful flight of 32 minutes plus to-day near Gotch Airport near here. After the folding prop closed the ship started to soar in about 300 foot circles and max. altitude was about 2000 feet. We followed the ship and were at hand when it landed 3½ miles from the starting point. Landing gear. M & M wheels & all complete. Sincerely yours,
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Senior Naval Aircraft Inspector U.S.N.

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PATS. PENDING ON AUTOMATIC PROPELLER
Wingspan 41", length 30", wt. 3 oz. Kit contains all parts to assemble folding propeller—MAMCO BALL BEARING propeller shaft—M & M model wheels—special brown contest rubber motor—glue, dope, tissue, wing ribs and other parts printed "on AAA" sheet balsa—all strips cut to size—full size detail 3-view drawing.
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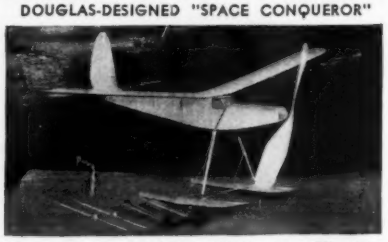

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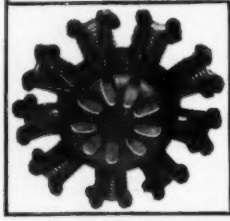

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H. Grant, Editor of MODEL AIRPLANE NEWS. The Field Operation Officer was Mr. Nathan Polk. Mr. McKinnon had the very important duty of supervising the policing of the crowds. We wish to extend our greatest thanks to him, for this was a most difficult duty to perform. Mr. A. J. Vhay, assisted by a number of members of the Recreation Department of Detroit, including Mr. Stevens, was in charge of equipment and arranging the physical facilities of the contest. Mrs. H. M. Jellison, Mrs. Harrington, Mrs. Brown and Mrs. Claire of Akron, Ohio, rendered invaluable services in performing the extensive clerical work required. This is one of the most difficult tasks that presented itself. Our great appreciation is extended especially to Mrs. Jellison and Mrs. Harrington.

Each day the contest activities began at about 9:00 o'clock. They ended, as a rule, at 2:00 or 3:00 in the morning, in fact some contestants worked continuously throughout the night to prepare their planes for the following day.

One of the most enjoyable features of the contest was the humor and news presented in "The Daily Blurb" for which Mr. Al Lewis and Mr. Bruno Marchi were responsible. No contest would be complete without the publication of this interesting journal. One was presented to every member of the contest at the dinner given Monday night and we firmly believe that it was a great contribution to their enjoyment as well as an aid to their digestion.

It was announced at the dinner that the 1938 Nationals would be held at Detroit, and that immediate steps would be taken to make preparations in order to allow plenty of time to have a completely organized contest.

Greatest appreciation is extended to the following donors: Thomas B. Colby and Berry Bros. underwrote the Meet paying all the basic expenses. . . . Squire D. Eurich, Chairman Aviation Committee of Exchange Club No. 1 of Detroit gathered eight trophies for the committee. . . . City of Detroit Recreation Dept. put at our disposal all of their model aviation instructors. . . . Selfridge Field co-operated with officers and men. . . . Chevrolet donated 1200 box lunches. . . . Ford Motor Company sponsored the final dinner. . . . J. L. Hudson Co., leading Dept. store of Detroit, had window displays of trophies, furnished truck transportation and display cases for the Exposition. . . . Jefferson Beach treated contestants to a park-party. . . . Board of Education transported contestants by buses. . . . Square D. Company contributed to the financial support of the contest. . . . Toledo Scale Co. provided us with two scales. . . . Capt. Richard A. Leavell acted as our public relations counsel and did a fine job. . . . We are grateful to the Fort Shelby Hotel for putting us up and putting up with us. . . . Cheers for the Model Manufacturers who supported the Meet through their participation in the Model Aircraft Exposition. . . . O.K's to Henry Baker, manager of Wayne County Airport—by O.K. we mean he was awfully kind. . . . Bouquets to Chrysler Motors for being our host this afternoon and permitting us to inspect their plant on various days. . . . To Sommers, Allan, Brown, Munnick, Lucas, Grant, MacKinnon, The Polks, Roll, Balough, Althouse, and Tabraham go our deepest thanks for their valuable aid during the Tenth National Brawl. To everybody on the contest committee of Detroit N.A.A. Chapter goes our gratitude. To Mr. Jellison and his Akron assistants our deepest thanks. There are dozens of others who deserve a page a piece for their kindness and consideration in making the 1937 Nationals possible. But the presses are waiting and we know they will overlook any omissions at this time.

TO THEM ALL: THANKS A MILLION.

A complete list of events, winners, time and awards follow:

Scale Model Results

(1) Max Sokol, Hamtramck, Mich.—Stinson Reliant, Berry Bros. Trophy.
(2) Peter Zaleski, Cleveland—Macon F9C2, Nathan Reese Award.
(3) M. B. Kleckner, Akron—Time Flies, Taylor-Young Trophy.
(4) Katherine Clark, Waterbury, Conn.—Mr. Mulligan, Syncro Ace Saw, Popular Aviation Medal.
(5) Kenneth Diget, Battle Creek, Mich.—Aeronaca, Popular Aviation Medal, Rifle.
(6) Robert Briggs, Brighton, Mass.—Sikorsky, Popular Aviation Medal, Targetteer Pistol.
(7) Tirey Vickers, St. Louis, Mo.—Laird, Popular Aviation Medal, Targetteer Pistol.
(8) Harry Copeland, Syracuse, N.Y.—Boeing, Popular Aviation Medal.
(9) Harry Copeland, Syracuse, N.Y.—Mr Mulligan, Popular Aviation Medal.
(10) Robert Barrows, Kalamazoo, Mich.—Fokker, Stinson Medal.
(11) Harry Copeland, Syracuse, N.Y.—Mr. Mulligan, Burr Patterson & Auld Medal.
Judges of the event were A. D. Althouse, George Tabraham and Charles H. Grant.

Outdoor Open Class Cabin Event

(1) R. Korda, Cleveland, time 54:13—Exchange Club Plaque, Model Aircraft Yearbook.
(2) C. Sholes, Pittsburgh, time 2:39.8—Syncro Ace Engine, Model Craftsman Magazine.
(3) L. Wriston, Tulsa, time 2:10.6—Popular Aviation Medal, Targetteer Pistol.
(4) R. Bodle, Akron, time 1:51—Popular Aviation Medal, Targetteer Pistol.
(5) F. Zaic, New York, time 1:46—Popular Aviation Medal, Targetteer Pistol.
(6) H. Fish, Akron, time 1:45—Popular Aviation Medal, Targetteer Pistol.
(7) R. Gable, Reading, Pa., time 1:27—Stinson Medal, MODEL AIRPLANE NEWS Sub.

(8) H. Walker, Cleveland, time 1:18—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(9) C. Lanzo, Cleveland, time 1:17.6—Popular Aviation Medal.
(10) B. Marchi, Medford, Mass., time 1:12.6—Popular Aviation Medal.
(11) J. Romanowski, Jersey City, N.J., time 1:02.5—Popular Aviation Medal.

Outdoor Senior Class Cabin Event

(1) R. Stoner, Rockford, Ill., time 12:52.2—Stout Perpetual Trophy, Ohlsson Engine, Model Aircraft Yearbook, 1,000 mile trip on United Airlines.
(2) M. Arnold, Columbus, Ohio, time 10:30.5—Warner Trophy, Model Craftsman Magazine.
(3) K. Carpenter, Akron, time 8:13—Jefferson Beach Trophy.
(4) M. Karlak, Cleveland, time 5:19.2—Syncro Saw, Exchange Club Medal.
(5) J. Zimmer, Syracuse, N.Y., time 4:47.6—Popular Aviation Medal, Rifle.
(6) H. Dolfi, Chicago, time 4:20.4—Popular Aviation Medal, Targetteer Pistol.
(7) A. Schilperott, time 3:21—Popular Aviation Medal, Targetteer Pistol.
(8) J. Kubilis, Chicago, time 3:04.8—Popular Aviation Medal, Targetteer Pistol.
(9) L. Eisinger, Staten Island, N.Y., time 2:51.4—Stinson Medal, MODEL AIRPLANE NEWS.
(10) L. Bailey, Akron, time 2:47—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(11) H. LaClaire, Detroit, time 2:45—Popular Aviation Medal.
(12) A. Dague, Tulsa, time 2:36—Popular Aviation Medal.
(13) W. Jackson, Detroit, time 2:33.2—Popular Aviation Medal.
(14) F. Dewey, Grosse Pointe, Mich., time 2:33—Popular Aviation Medal.
(15) R. Apgar, Minneapolis, time 2:32.8—Exchange Club Medal.
(16) J. Houbalt, McHenry, Ill., time 2:32.4—Burr Patterson and Auld Medal.
(17) E. Stahl, Johnstown, Pa., time 2:32—Burr Patterson and Auld Medal.
(18) B. Luckett, Tulsa, time 2:31.8—Exchange Club Medal.
(19) L. Kovnat, Chicago, time 2:30—Flying Aces Sub.
(20) E. Naudzius, Detroit, time 2:24.8—Popular Aviation Medal.

Senior Mulvihill Event

(1) A. Dague, Tulsa, time 33:02—Mulvihill Trophy, Syncro Ace Engine, 1,000 mile American Airways trip, Model Aircraft Yearbook.
(2) H. Falkowski, Buffalo, time 20:11—Hotel Fort Selby Trophy, Model Craftsman Magazine.
(3) G. Driscoll, Staten Island, N.Y., time 9:20—American Legion Trophy.
(4) M. Dikovitsky, Cleveland, time 6:03.4—Seversky Trophy.
(5) B. Luckett, Tulsa, time 4:36—Syncro Saw, Exchange Club Medal.
(6) E. Stahl, Johnstown, Pa., time 4:31—Popular Aviation Medal, Rifle.
(7) D. Everett, Elm Grove, W. Va., time 4:25.4—Popular Aviation Medal, Targetteer Pistol.
(8) W. Simmers, Chicago, time 3:06.8—Popular Aviation Medal, Targetteer Pistol.
(9) J. Palikaritus, Rockford, Ill. time 3:06—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(10) B. Hatterman, Coroapolis, Pa., time 3:02.2—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(11) H. Gieryn, Detroit, time 3:00—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(12) R. Guilfoy, St. Louis, Mo., time 2:57—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(13) J. Noonan, Milwaukee, time 2:53—Popular Aviation Medal.
(14) R. Obarski, Chicago, time 2:47—Popular Aviation Medal.
(15) E. Naudzius, Detroit, time 2:43—Exchange Clubs Medal.
(16) R. Hoffman, Tulsa, time 2:41.4—Burr Patterson & Auld Medal.
(17) A. Wagner, Ardmore, Pa., time 2:35.6—Burr Patterson & Auld Medal.
(18) E. Swort, Chicago, time 2:35.5—Exchange Clubs Medal.
(19) K. Lane, Milwaukee, time 2:32.4—MODEL AIRPLANE NEWS Sub.
(20) M. Roll, Dearborn, time 2:28.4—Popular Aviation Medal.
(21) W. Ying, Staten Island, N.Y., 2:28—Burr Patterson & Auld Medal.
(22) C. Janke, Sheboygan, Wis., time 2:25.6—Burr Patterson & Auld Medal.
(23) R. Chatelain, Findlay, Ohio, time 2:25—Burr Patterson & Auld Medal.
(24) A. Kasiouskas, Akron, time 2:17—Burr Patterson & Auld Medal.
(25) J. Houbolt, McHenry, Ill., time 2:16—Burr Patterson & Auld Medal.
(26) W. Hewitt Phillips, Belmont, Mass., time 2:12.6—Popular Aviation Medal.
(27) B. Jeffry, Findlay, Ohio, time 2:07.2—Popular Aviation Medal.
(28) J. Cahill, Indianapolis, time 2:06—Popular Aviation Medal.
(29) B. Fitzgerald, Denver, time 2:05—Popular Aviation Medal.
(30) T. Just, Johnstown, Pa., time 2:04—Popular Aviation Medal.
(31) C. Turansky, Ambridge, Pa., time 2:03.8—Flying Aces Sub.

Outdoor Stick Open Class Event

(1) B. Anderson, Akron, time 12:52—Balfour Perpetual Trophy, Warner Aircraft Permanent Trophy, Model Aircraft Yearbook.
(2) C. Lanzo, Cleveland, time 7:55—Taylor-Young Trophy, Model Craftsman Sub.
(3) C. Janke, Sheboygan, Wis., time 2:25.6—Popular Aviation Medal, Targetteer Pistol.
(4) S. Patrick, Wyandotte, Mich., time 2:05—Popular Aviation Medal, Targetteer Pistol.
(5) R. Wriston, Tulsa, time 2:04.4—Popular Aviation Medal, Targetteer Pistol.
(6) F. Nekimken, Chicago, time 1:53—Popular Aviation Medal, Targetteer Medal.
(7) J. Dilly, Galt, Ont., time 1:40—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(8) D. Seltzer, St. Louis, Mo., time 1:38—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(9) M. Barsley, St. Catherine, Ont., time 1:35—Popular Aviation Medal.
(10) C. Sholes, Pittsburgh, time 1:34.8—Popular Aviation Medal.
(11) F. Zaic, New York City, time 1:34—Popular Aviation Medal.
(12) H. Fish, Akron, time 1:33.4—Popular Aviation Medal.
(13) J. Ginnetti, Atlantic City, time 1:33—Exchange Clubs Medal.
(14) J. Michaels, Crawfordsville, Ind., time 1:31.4—Burr Patterson & Ault Medal.
(15) F. Haynes, New York City, time 1:29—Burr Patterson & Ault Medal.
(16) J. Romanski, Jersey City, N.J., time 1:24.8—Exchange Clubs Medal.

Stout Indoor Stick Model Event (Sr.)

(1) W. Simmers, Chicago, time 21:30—Stout Perpetual Trophy, Syncro Ace Engine, Round trip to Washington on Pennsylvania Central Airlines, Model Aircraft Yearbook.
(2) A. Koslow, Philadelphia, time 20:16.5—Gar Wood Trophy, Model Craftsman Sub.
(3) M. Hugelet, Chicago, time 20:02.2—Square Deal Miller Trophy.
(4) R. Jacobson, Philadelphia, time 19:12—Syncro Saw, Exchange Clubs Medal.
(5) H. Dolfi, Chicago, time 18:57.5—Popular Aviation Medal, Rifle.
(6) Hewitt Phillips, Belmont, Mass., time 18:13—Popular Aviation Medal, Targetteer Pistol.
(7) F. Falkowski, Buffalo, time 17:25.8—Popular Aviation Medal, Targetteer Pistol.
(8) E. Leshner, Philadelphia, time 16:53.7—Popular Aviation Medal, Targetteer Pistol.
(9) M. Malley, Atlantic City, time 16:40—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(10) A. Dague, Tulsa, time 16:02—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(11) R. Hammer, New York City, time 15:31.6—Popular Aviation Medal.
(12) S. Axelrod, Chicago, time 15:28—Popular Aviation Medal.
(13) W. Tyler, Everett, Mass., time 15:23.8—Popular Aviation Medal.
(14) H. LaClair, Detroit, time 15:19—Popular Aviation Medal.
(15) J. Houbolt, McHenry, Ill., time 15:10—Exchange Clubs Medal.
(16) W. Erback, Sheboygan, Wis., time 15:09.8—Burr Patterson & Ault Medal.
(17) R. Obarski, Chicago, 15:01—Burr Patterson & Ault Medal.
(18) T. Petrides, New York City, time 15:00—Flying Aces Sub.
(19) C. Belsky, Chicago, time 14:56.8—Exchange Clubs Medal.
(20) T. Cunningham, Chicago, time 14:52.5—Exchange Clubs Medal.

Indoor Stick Model Open Class Event

(1) T. Harris, Toronto, time 20:37—Springfield Perpetual Trophy, Springfield Permanent, Miniature Trophy, Model Aircraft Yearbook.
(2) C. Goldberg, Chicago, time 20:05.8—Flying Aces Trophy, Model Craftsman Magazine.
(3) F. Haynes, New York City, time 18:37—Popular Aviation Medal, Rifle.
(4) B. Marchi, Medford, Mass., time 17:57—Popular Aviation Medal, Targetteer Pistol.
(5) W. Brown, Arlington, Mass., time 17:35—Popular Aviation Medal, Targetteer Pistol.
(6) W. Good, Kalamazoo, Mich., time 16:48.6—Popular Aviation Medal, Targetteer Pistol.
(7) H. Greenberg, Newark, time 15:55—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(8) J. Matulis, Chicago, 15:54—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(9) G. Johnstone, Detroit, time 14:53.6—Popular Aviation Medal.
(10) R. Wriston, Tulsa, time 14:34—Popular Aviation Medal.
(11) E. Fulmer, McKees Rocks, Pa., time 14:25—Popular Aviation Medal.
(12) B. Insana, Buffalo, time 13:21—Popular Aviation Medal.
(13) R. Lyszczarz, Buffalo, time 11:12—Burr Patterson & Ault Medal.
(14) J. Dilly, Galt, Ont., time 8:43—Burr Patterson & Ault Medal.
(15) O. Corfield, Port Dalhousie, Ont., time 8:03—Burr Patterson & Ault Medal.

Indoor Cabin Bloomingdale Event (Sr.)

(1) A. Dague, Tulsa, time 15:41—Bloomingdale Perpetual Trophy, Ohlsson Engine (Dallaire Award), Round trip to Washington on Penn. Central Airlines, Model Aircraft Yearbook.

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(2) J. Cahill, Indianapolis, time 13:58.4—Baker Restaurant Trophy, Model Craftsman Magazine.
(3) E. Barrie, Galt, Ont., time 13:46—Guillow Trophy.
(4) M. Huguelet, Chicago, time 12:55—Seversky Aircraft Award.
(5) D. Clini, Springfield, Mass., time 12:05.4—Popular Aviation Medal, Rifle.
(6) W. Erbach, Sheboygan, Wis., time 12:00—Popular Aviation Medal, Targetteer Pistol.
(7) M. Malley, Atlantic City, time 11:08.1—Popular Aviation Medal, Targetteer Pistol.
(8) W. Simmers, Chicago, time 11:05—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(9) T. Capo, Quincy, Mass., time 9:59—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(10) E. Swort, Chicago, time 9:54—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(11) J. Chadwick, Syracuse, time 9:44—Popular Aviation Medal.
(12) E. Leshner, Philadelphia, time 7:27.6—Popular Aviation Medal.
(13) J. Conradi, St. Louis, Mo., time 6:40.4—Popular Aviation Medal.
(14) R. Marquardt, Arlington, Iowa, time 5:35.8—Popular Aviation Medal.
(15) R. Carlson, Springfield, Mass., time 4:17.2—Exchange Clubs Medal.
(16) A. Anderson, Chicago, time 3:44—Burr Patterson & Ault Medal.

Indoor Cabin Event (Open) Class

(1) J. Ginnetti, Atlantic City, time 17:48.6—John Kay Propeller Clock, Model Aircraft Yearbook.
(2) R. Wriston, Tulsa, time 13:36—Comet Model Airplane Trophy, Model Craftsman Trophy.
(3) D. Donahue, Highland Park, Calif., time 12:49—Popular Aviation Medal, Rifle.
(4) T. Harris, Toronto, time 10:31—Popular Aviation Medal, Targetteer Pistol.
(5) W. Brown, Arlington, Mass., time 10:12—Popular Aviation Medal, Targetteer Pistol.
(6) B. Marchi, Medford, Mass., time 10:16.1—Popular Aviation Medal, Targetteer Pistol.
(7) F. Haynes, New York City, time 8:55—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(8) J. Matulis, Chicago, time 8:49—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(9) W. Good, Kalamazoo, Mich., time 7:50—Popular Aviation Medal.
(10) E. Fulmer, McKees Rocks, Pa., time 7:10.1—Popular Aviation Medal.

Du Pont Gas Competitions

(The Rate—18.8c per point)

(1) A. Dillon, Jackson, Mich., 114 points—Dupont Trophy.
(2) C. Ellis, Detroit, 106 points—Dupont Troyphy.
(3) M. Anderson, Staten Island, N.Y., 104.9 points—Dupont Trophy.

Berryloid G. S. Finish Winner

A. Anderson, Chicago, Berryloid Trophy.

Gas Model Event—Open

(1) M. Bassett, Philadelphia, time 70:02—Gar Wood Trophy, Model Aircraft Yearbook.
(2) C. Goldberg, Chicago, time 52:45—American Legion Trophy, Targetteer Pistol.
(3) B. Anderson, Akron, time 52:10—Burgess-Battery Trophy, Exchange Clubs Medal, Model Craftsman Magazine Sub.
(4) M. Roll, Dearborn, time 49:07.1—Popular Aviation Medal, Targetteer Pistol.
(5) Dr. G. Covington, Chicago, time 47:12.6—Popular Aviation Medal, Targetteer Pistol.
(6) M. Kostick, Akron, time 42:31—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(7) W. Mott, Staten Island, N. Y., time 26:22.6—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(8) R. Korda, Cleveland, time 25:45—Popular Aviation Medal.
(9) J. Konefes, Chicago, time 17:55—Popular Aviation Medal.
(10) P. Kiewicz, Detroit, time 15:58—Popular Aviation Medal.
(11) B. File, Columbus, time 15:50.4—Popular Aviation Medal.
(12) F. Tlush, Lyndhurst, N. J., time 13:31—Burr Patterson & Auld Medal.
(13) E. Guth, Liverpool, N.Y., time 12:25.3—Burr Patterson & Auld Medal.
(14) J. Trefny, Chicago, time 10:34—Burr Patterson & Auld Medal.
(15) H. Stofer, Indianapolis, time 9:20.4—Burr Patterson & Auld Medal.
(16) C. Ellis, Detroit, time 9:05—Exchange Clubs Medal.
(17) E. Fulmer, McKees Rocks, Pa., time 7:46—Flying Aces Medal.
(18) J. Romanowski, Jersey City, time 7:39—Exchange Clubs Medal.
(19) R. Gable, Reading, Pa., time 6:39—Exchange Clubs Medal.

Gas Model Event—Senior

(1) F. Hanley, Ft. Worth, time 50:29—Texaco Perpetual Award, Yearbook, Miniature Trophy, Syncro Ace Engine, 600 Mile trip on Amer. Airways.
(2) M. Malley, Atlantic City, time 47:10.4—Gar Wood Trophy, Model Craftsmen Sub.
(3) C. Krupp, Akron, time 45:47—Baker Eberly Trophy.
(4) K. Patterson, Detroit, time 37:52—American Legion Trophy.
(5) E. Konefes, Chicago, time 36:47—Flying Aces Trophy.
(6) F. Kiewicz, Detroit, time 36:40—Baby Cyclone Engine, Propeller.
(7) S. Axelrod, Chicago, time 31:26—Seversky Trophy.
(8) C. Thomas, Buffalo, time 25:40.5—Syncro Ace Engine, Popular Aviation Medal.
(9) E. Naudis, Detroit, time 22:38—Miss Philadelphia Kit.
(10) J. Houbolt, McHenry, time 22:32.4—Lorenzo Propeller, Exchange Clubs Medal, Targetteer Pistol.
(11) B. Long, Reading, time 22:15—Popular Aviation Medal, Targetteer Pistol.
(12) R. Jacobsen, Philadelphia, time 21:46—Popular Aviation Medal, Targetteer Pistol.
(13) C. Tracy, Toledo, time 19:15—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(14) R. Kruck, Detroit, time 19:01—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(15) M. Granieri, Newark, time 17:23—Popular Aviation Medal.
(16) J. Beckelman, Fort Worth, time 16:26—Popular Aviation Medal.
(17) R. Dittman, Denver, time 15:45—Popular Aviation Medal.
(18) D. Lodge, Indianapolis, time 15:09—Exchange Clubs Medal.
(19) F. Casterline, Northville, Mich., time 14:05—Popular Aviation Medal.
(20) L. Goebel, Chicago, time 13:52.4—Burr Patterson Auld Medal.
(21) L. Klesman, Chicago, time 13:30—Exchange Club Medal.
(22) A. Pow, Toronto, time 12:17.2—Burr Patterson Auld Medal.
(23) V. Krehbiel, Williamsville, N.Y., time 12:17—Popular Aviation Medal.
(24) E. Miller, Detroit, time 12:14—Burr Patterson Auld Medal.
(25) E. Schumacher, Oakland, Cal., time 12:04—Burr Patterson Auld Medal.
(26) Hewitt Phillips, Belmont, Mass., time 12:03—Burr Patterson Auld Medal.
(27) F. Ross, Media, Pa., time 12:00—Burr Patterson Auld Medal.
(28) DeW. Ross, Tulsa, time 11:47—Flying Aces Sub.

Wakefield International Event

(1) H. Fish, Akron, time 8:26.1—Exchange Clubs Medal, $25 Air Trails Cash Prize.
(2) A. Dague, Tulsa, time 8:25.4—Popular Aviation Medals, Model Aircraft Yearbook.
(3) R. Korda, Cleveland, time 6:00—Popular Aviation Medal.
(4) R. Bodle, Akron, time 5:50 2/3—Popular Aviation Medal.
(5) J. Cahill, Indianapolis, time 5:33.4—Popular Aviation Medal.
(6) C. Lanzo, Cleveland, time 3:01 2/3—Popular Aviation Medal.

Moffett International Event

(1) J. Cahill, Indianapolis, time 15:45.1—Moffett Trophy, Moffett Miniature, 400 mile trip American Airlines, Model Aircraft Yearbook.
(2) C. Lanzo, Cleveland, time 7:35.4—Large Shell Trophy, Model Craftsman Magazine.
(3) A. Dague, Tulsa, time 6:13.5—Smaller Shell Trophy.
(4) H. Fish, Akron, time 2:44.5—Smaller Shell Trophy.
(5) R. Korda, Cleveland, time 2:01.6—Popular Aviation Medal. Rifle.
(6) D. Kennedy, New Zealand, time 1:35—Popular Aviation Medal. Rifle.
(7) W. Mackley, New Zealand, time 1:28.2—Popular Aviation Medal. Rifle.
(8) A. Gee, Galt, Ont., time 1:17.7—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(9) E. Barrie, Galt, Ont., time :51.5—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(10) McGuire, New Zealand, time :50.6—Stinson Medal, MODEL AIRPLANE NEWS Sub.
(11) Rightner, New Zealand, time :45—Popular Aviation Medal.
(12) R. Bodle, Akron, Elim. Team—Popular Aviation Medal.
(13) R. Smith, Toronto, Elim. Team—Popular Aviation Medal.
(14) H. Dolson, Preston, Ont., Elim. Team—Popular Aviation Medal.
(15) F. Bauer, Toronto, Elim. Team—Exchange Clubs Medal.
(16) R. Milligan, Toronto, Elim. Team—Burr Patterson Auld Medal.

Radio Controlled Gas Model Event

(1) C. Lanzo, Cleveland—**Model Airplane News** Trophy, Edwards Roberts Trophy, Ohlsson Engine, $10 Cash Prize.
(2) P. Sweeney, Chicago—A.C. Spark-Plug Trophy $10 Cash Prize.
(3) E. Wasman, Jacksonville—Flying Aces Trophy, $10 Cash Prize.
(4) W. Good, Brooklyn—Taylor-Young Trophy, $10 Cash Prize.
(5) L. Weiss, Brooklyn—Exchange Club Medal, Rifle, $10 Cash Prize.
(6) B. Schiffman, New York City—Popular Aviation Medal, Targetteer Pistol.

Most Active Girl Contestant

Mary Roll, Dearborn, Mich.—Women's Aeronautic Association of Detroit Trophy.

Flying Scale Model Event

(1) L. Bailey, Akron—William O'Neal General Tire and Rubber Co. Trophy, G.H.Q. Gas Engine.
(2) F. Franz, Detroit—Stinson Medal.

With appreciation to "The Blurb" for the list of donors.

Now You Can Check That Line of Thrust

(Continued from page 15)

slits in the tube, insert the brad and she's ready for use.

Checking

Lift the tail of the ship into flying position. Push the tube over the crankshaft of the engine and read the dial! It's really simple. Just adjust your engine until you get the proper reading as prescribed by the plans or your own calculations, then set your stabilizer accordingly. For ordinary purposes a positive angle of one to one and one-half degrees will do very well. With such an angle the wing may then be set at between two and three degrees angle of incidence thereby aiding efficiency. As all of these settings can be figured on paper by drawing a side view of the ship and running a line through the fuselage for the L. of T., then measuring from this line and actually fixing the engine at the exact desired angle, few builders can go wrong.

When you are satisfied with your settings, check all of the surfaces for warp and correct any that may be found. Check the C.G. of the ship by balancing. It should balance not more than one-third of the chord from the leading edge of the wing. For the first flight it is best to have it a bit nose heavy. With a "sweet engine" you need not worry a great deal about results.

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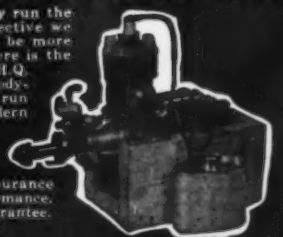

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From Coast to Coast Model Airplane Builders are Asking us

"What Are the Kits of the

Well, here's the answer: They are, for the most part, of built-up wooden construction which can be finished and hand painted. However, for simplification and startling realism, we employ a "short cut" we discovered years ago, namely, covering all woodwork with specially printed-in-color paper which carries all lettering, figures and mechanical details. These sheets come with the Kit and are simply glued on the finished model, then varnished if desired. Wheels are supplied turned of wood. The framework and couplers printed out on wood, to be cut out by hand, to make up "dummy" trucks and couplers (later, at a reasonable price, you can replace these with working trucks and couplers we will have ready in the Fall, to operate your "Rep" models on a "Super" model layout or may be left as is simply for atmosphere to stand on side tracks).

On the locomotives, while the wheels and hubs are turned, on those requiring spokes, these must be assembled by the builder. This is easily done by simply sanding down a small strip to the proper cross-sectional size, cutting to length and placing between the hub and tire (lots easier than it sounds, for wheel layouts are provided). On the wheels with oval shaped lightening holes, like the Hiawatha, these may either be hollowed out or simply painted in to represent the holes.

Here's the Story in a Nutshell

1. All locomotive cabs, tender and cab sides, tops and ends as well as freight cars completely printed out—lettering and all—in full realistic colors, where possible (roofs of Hiawatha train must be painted gray because of their more or less intricate designs even though all are simply made).

2. Wheels supplied turned, requiring only hand work to complete. They all roll, and locomotive mechanism "works."

3. Necessary locomotive "mechanism," bulkheads, walks, truck side frames, etc., printed out.

4. All necessary strips, blocks and pieces to complete the entire locomotive tenders or cars.

5. All fill in materials to realistically simulate the metal or solid wood construction as it appears on the prototype.

6. All wire, special printed, lettered and detailed covering paper, screws, escutcheon pins, axles included, etc., etc., etc.

7. And last, but most important of all, included in each Kit is a completely detailed full sized, copyrighted authentic Rep drawing, enabling you to make each model most easily by the easy model design methods worked out—far more easily made than might be believed. But please don't criticise "wood and paper" construction until you really know what it is like. Try a few and you will find that it is not necessary to make models of metal, especially if you object to higher prices. Really, we're paving the way to an entirely brand new type of model railroading that everyone can afford to build.

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RS-2	Hiawatha Tap-Diner Car	.75
RS-3	Hiawatha Coach	.75
RS-4	Hiawatha Beaver Tail Car	.75

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These Kits are all dry—no cements or colors are included with them. The models they build are known as Representative (Rep) models. In the Fall, we will start bringing out a line of "Super Models." By simply employing working couplers, detaching the dummy trucks, and replacing them with actual working trucks, all your "Rep" (cars only) models can be used as your "Super Model" layout. This line of models shall be known as the C-D DE LUXE LINE.

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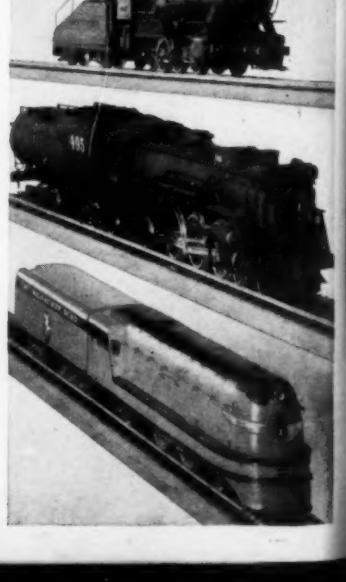

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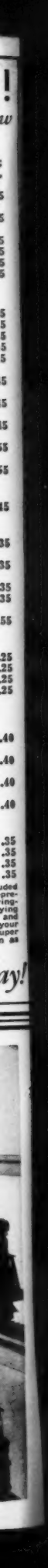
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